

ENVIRONMENTAL NOISE ANALYSIS

LIBERTY QUARRY

Riverside County, California

BBA Project No. 05-225

Prepared For

Lilburn Corporation
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January 28, 2009

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EXECUTIVE SUMMARY

This noise analysis has been prepared to assess the potential noise impacts of the proposed Liberty Quarry (“project”) to be located in Riverside County, California, south of the City of Temecula. The quarry operation will introduce several noise sources to the project site, including heavy trucks on access roads, mining equipment, aggregate and asphalt processing equipment, a concrete batch plant, a power plant, and an asphalt-concrete recycling plant. The project site is surrounded by a variety of land uses, including residences, agriculture, and the Santa Margarita Ecological Reserve (SMER). Interstate 15 (I-15) is adjacent to the eastern project boundary. The potentially affected jurisdictions include Riverside County, the City of Temecula, and San Diego County.

To describe the project setting in terms of ambient noise levels, Brown-Buntin Associates, Inc. (BBA) conducted noise measurements at nine Receptor Locations in the project vicinity. The noise monitoring sites were selected to represent existing noise levels in all noise-sensitive areas that are potentially affected by noise associated with project activity. Due to the presence of I-15 and other factors, ambient noise levels are relatively high, and in some cases exceed the applicable noise standards. Ambient noise levels at all monitoring stations exceed the applicable maximum noise level standards (L_{max}) under the Riverside County Noise Ordinance.

This analysis applies measured ambient noise levels and frequency content of representative noise sources to the Environmental Noise Model (ENM), a commercially-available analysis model, in order to predict project-related noise levels at sixteen separate Receptor Locations in the project vicinity. These Receptor Locations were selected to represent the project-induced noise impacts to all potential receivers in the project vicinity.

This analysis examines project-related noise levels based on all applicable significance criteria, as applied in the potentially affected jurisdictions. The analytical criteria include average noise levels (L_{eq}), land use compatibility (L_{dn}), project-induced changes in ambient noise levels, traffic noise, construction noise, and blasting noise. Without mitigation, the project would result in noise levels in excess of the applicable standards for average noise (L_{eq}) and land use compatibility (L_{dn}) at a small number of Receptor Locations during a number of project Phases.

With the mitigation measures described here, the project will comply with all applicable standards of significance under the California Environmental Quality Act (CEQA). The mitigation measures include line of sight noise barriers at various locations, restrictions on mining and recycling plant activities between 10 p.m. and 7 a.m., equipment enclosures and mufflers, and the dedication of a 400-foot setback along the northern project boundary. Therefore, for CEQA purposes, the mitigated project will not result in any significant noise impacts.

Although the project will not result in significant impacts under CEQA, some project activities may generate maximum noise levels (L_{max}) in excess of the Riverside County Noise Ordinance standards. This is largely due to the ambient maximum noise levels, although some project activities themselves may exceed the L_{max} standards. Given that the existing conditions exceed

the Noise Ordinance standards, and the projects impacts can be mitigated to below a level of significance, the project may qualify for an exception to the Noise Ordinance.

INTRODUCTION

This noise analysis has been prepared to assess the potential noise impacts of the proposed Liberty Quarry, to be located in Riverside County south of Temecula, California. The quarry operation will introduce several noise sources to the project site, including heavy trucks on access roads, mining equipment, aggregate and asphalt processing equipment, a concrete batch plant, a power plant, and an asphalt-concrete recycling plant. Potentially significant noise sources include on- and off-site heavy trucks, loaders, bulldozers, a power shovel, generator sets, asphalt burners, crushers and screens.

The project site is surrounded by a variety of land uses, including residences, agriculture, and the Santa Margarita Ecological Reserve (SMER). I-15 is adjacent to the eastern project boundary. The potentially affected jurisdictions include Riverside County, the City of Temecula, and San Diego County.

Fundamentals of Acoustics

Noise is often described as unwanted sound, and thus is a subjective reaction to the physical phenomenon of sound. Sound is variations in air pressure that the ear can detect. The ear responds to pressure changes over a range of 10^{14} to 1. This is roughly equivalent to the range of 1 second as compared to 3.2 million years, or 1 square yard compared to the entire surface area of the earth. To deal with the extreme range of pressures which the ear can detect, researchers express the amount of acoustical energy of a sound by comparing the measured sound pressure to the reference pressure of 20 micropascals, then taking the logarithm (base 10) of the square of that number. This original unit of sound measurement, named the bel after Alexander Graham Bell, corresponded well to human hearing characteristics if it was divided by a factor of 10. The resulting unit, one tenth of a bel, is called the decibel, and is abbreviated as dB.

The threshold of hearing is considered to be zero (0) dB, and the range of sounds in normal human experience is 0 to 140 dB. Because sound pressure levels are defined as logarithmic numbers, the values cannot be directly added or subtracted. For example, two sound sources, each producing 50 dB, will produce 53 dB when combined, not 100 dB. This is because two sources have two times the energy of one source, and 10 times the logarithm of 2 equals 3. Similarly, ten sources produce a 10 dB higher sound pressure level than one source, as ten times the logarithm of 10 equals 10.

The ear responds to pressure variations in the air from about 20 times per second to about 20,000 times per second. The frequency of the variations is described in terms of hertz (Hz), formerly called cycles per second. The ear does not respond equally to all frequencies. For example, we do not hear very low frequency sounds as well as we hear higher frequency sounds, nor do we hear very high frequency sounds very well. This difference in perceived loudness varies with the sound pressure level of the sound. In general, the maximum sensitivity of the ear occurs at frequencies between about 500 and 8000 Hz.

To compensate for the fact that the ear is not as sensitive at some frequencies and sound pressure levels as at others, a number of frequency weighting scales have been developed. The "A"

weighting scale is most commonly used for environmental noise assessment, as sound pressure levels measured using an A-weighting filter correlate well with community response to noise sources such as aircraft and traffic.

When an A-weighting filter is used to measure sound pressure levels, the results may be expressed as *sound levels*, in decibels (dB). It is sufficient to use the abbreviation "dB" if these terms are well defined, but many people prefer to use the expressions dBA or dB(A) for clarity. For convenience, many people use the term "noise level" interchangeably with "sound level." Table I shows typical sound levels and relative loudness for various types of noise environments.

The ambient noise level is defined as the noise from all sources near and far, and refers to the noise levels that are present before a noise source being studied is introduced. A synonymous term is pre-project noise level. Noise exposure contours or noise contours are lines drawn about a noise source representing constant levels of noise exposure. CNEL or L_{dn} (DNL) contours are frequently utilized to graphically portray community noise exposure. The terms CNEL and L_{dn} (DNL) are defined in the following section.

Environmental Noise Descriptors

Most environmental noise sources produce varying amounts of noise over time, so the measured sound levels also vary. For example, noise produced during a train passage will vary from relatively quiet background levels before the event to a maximum value when the train passes by, then returning down to background levels as the train leaves the observer's vicinity. Similarly, noise from traffic varies with the number and types of vehicles, speed and proximity to the observer.

Variations in sound levels may be addressed by statistical methods. The simplest of these are the maximum (L_{max}) and minimum (L_{min}) noise levels, which are the highest and lowest levels observed. To describe less extreme variations in sound levels, other statistical descriptors may be used, such as the L_{10} and L_{50} and L_{90} . The L_{10} is the A-weighted sound level equaled or exceeded during 10 percent of a time period. Similarly, the L_{50} and L_{90} are the sound levels equaled or exceeded during 50 and 90 percent of a time period. The most common time period used with these statistical descriptors is 1 hour, although any time period could be used so long as it is stated. Because statistical descriptors such as L_{10} , L_{50} , etc. are sometimes cumbersome to calculate, the equivalent sound level (L_{eq}) or energy average sound level is often used to describe the "average" sound level during a stated time period, usually 1 hour.

The Day-Night Level (DNL or L_{dn}) is calculated from hourly L_{eq} values, after adding a "penalty" to the noise levels measured during the nighttime (10 p.m. to 7 a.m.) hours. The penalty for nighttime hours is a factor of 10, which is equivalent to 10 dB. Refer to Appendix A for additional definitions of acoustical terminology.

TABLE I			
EXAMPLES OF A-WEIGHTED SOUND LEVELS AND RELATIVE LOUDNESS			
Sound Source	Sound Level (dBA)	Relative Loudness (approximate)	Relative Sound Energy
Jet aircraft, 100 feet	130	128	10,000,000
Rock music with amplifier	120	64	1,000,000
Thunder, snowmobile (operator)	110	32	100,000
Boiler shop, power mower	100	16	10,000
Orchestral crescendo at 25 feet, noisy kitchen	90	8	1,000
Busy street	80	4	100
Interior of department store	70	2	10
Ordinary conversation, 3 feet away	60	1	1
Quiet automobile at low speed	50	1/2	.1
Average office	40	1/4	.01
City residence	30	1/8	.001
Quiet country residence	20	1/16	.0001
Rustle of leaves	10	1/32	.00001
Threshold of hearing	0	1/64	.000001

Source: U.S. Department of Housing and Urban Development, "Aircraft Noise Impact -- Planning Guidelines for Local Agencies," 1972.

SETTING: AMBIENT NOISE LEVELS

To describe the project setting in terms of ambient noise levels, Brown-Buntin Associates, Inc. (BBA) conducted noise measurements at nine of the designated “Receptor Locations” (“Receptors”) in the project vicinity (Figure 1).¹ The noise monitoring sites were selected to represent existing noise levels in noise-sensitive areas that are potentially affected by noise associated with project activity. The nine monitoring sites are as follows (see Figure 2 below):

- Ambient Measurement Site 1 (Receptor Location 14) – SMER Site 1
- Ambient Measurement Site 2 (Receptor Location 15) – SMER Site 2
- Ambient Measurement Site 3 (Receptor Location 10) - Cellular Tower
- Ambient Measurement Site 4 (Receptor Location 17) – 47725 Rainbow Valley Road
- Ambient Measurement Site 5 (Receptor Location 18) - 2658 Huffstatler
- Ambient Measurement Site 6 (Receptor Location 19) – Adjacent Private Property
- Ambient Measurement Site 7 (Receptor Location 20) – 31320 Via Eduardo
- Ambient Measurement Site 8 (Receptor Location 21) – Rainbow Valley Road (near Temecula)
- Ambient Measurement Site 9 (Receptor Location 35) – 28816 Pujol

¹ Figure 1 is a map prepared by Lilburn Corp., and depicts the Project Boundary and thirty-five (35) separate Receptor Locations used to assess various environmental impacts associated with the proposed Quarry. To maintain consistency with other environmental assessments prepared for the Liberty Quarry project, this analysis will refer to the Receptor Locations as numbered in Figure 1.

Receptor Locations

Library County Environmental Impact Report
 Riverside County, California

- LEGEND**
- Proposed Project Site
 - Approximate Center of Proposed Processing Facility
 - Distance in Miles from Processing Facility
 - Receptor Location and Number
 - City of Temecula Boundary

Point Information

Description	UTM Location (Easting)
1. Recker Point Check Point	487448.29, 3706842.49
2. Rainbow Reservoir	485207.53, 3694112.33
3. Rainbow Reservoir	485279.71, 3694809.31
4. Rainbow Reservoir	486071.88, 3703860.74
5. Rainbow Reservoir	485188.43, 3703303.66
6. Rainbow Reservoir	483410.99, 3706038.62
7. South SWEET Station	484832.64, 3703999.69
8. Callier Tower	484811.12, 3694546.37
9. Rainbow Reservoir	484824.12, 3706352.48
10. SWEET Site 1	484824.12, 3706352.48
11. SWEET Site 2	484824.12, 3706352.48
12. SWEET Site 3	484824.12, 3706352.48
13. SWEET Site 4	484824.12, 3706352.48
14. SWEET Site 5	484824.12, 3706352.48
15. SWEET Site 6	484824.12, 3706352.48
16. SWEET Site 7	484824.12, 3706352.48
17. SWEET Site 8	484824.12, 3706352.48
18. SWEET Site 9	484824.12, 3706352.48
19. SWEET Site 10	484824.12, 3706352.48
20. SWEET Site 11	484824.12, 3706352.48
21. SWEET Site 12	484824.12, 3706352.48
22. SWEET Site 13	484824.12, 3706352.48
23. SWEET Site 14	484824.12, 3706352.48
24. SWEET Site 15	484824.12, 3706352.48
25. SWEET Site 16	484824.12, 3706352.48
26. SWEET Site 17	484824.12, 3706352.48
27. SWEET Site 18	484824.12, 3706352.48
28. SWEET Site 19	484824.12, 3706352.48
29. SWEET Site 20	484824.12, 3706352.48
30. SWEET Site 21	484824.12, 3706352.48
31. SWEET Site 22	484824.12, 3706352.48
32. SWEET Site 23	484824.12, 3706352.48
33. SWEET Site 24	484824.12, 3706352.48
34. SWEET Site 25	484824.12, 3706352.48
35. SWEET Site 26	484824.12, 3706352.48
36. SWEET Site 27	484824.12, 3706352.48
37. SWEET Site 28	484824.12, 3706352.48
38. SWEET Site 29	484824.12, 3706352.48
39. SWEET Site 30	484824.12, 3706352.48
40. SWEET Site 31	484824.12, 3706352.48
41. SWEET Site 32	484824.12, 3706352.48
42. SWEET Site 33	484824.12, 3706352.48
43. SWEET Site 34	484824.12, 3706352.48
44. SWEET Site 35	484824.12, 3706352.48
45. SWEET Site 36	484824.12, 3706352.48
46. SWEET Site 37	484824.12, 3706352.48
47. SWEET Site 38	484824.12, 3706352.48
48. SWEET Site 39	484824.12, 3706352.48
49. SWEET Site 40	484824.12, 3706352.48
50. SWEET Site 41	484824.12, 3706352.48
51. SWEET Site 42	484824.12, 3706352.48
52. SWEET Site 43	484824.12, 3706352.48
53. SWEET Site 44	484824.12, 3706352.48
54. SWEET Site 45	484824.12, 3706352.48
55. SWEET Site 46	484824.12, 3706352.48
56. SWEET Site 47	484824.12, 3706352.48
57. SWEET Site 48	484824.12, 3706352.48
58. SWEET Site 49	484824.12, 3706352.48
59. SWEET Site 50	484824.12, 3706352.48
60. SWEET Site 51	484824.12, 3706352.48
61. SWEET Site 52	484824.12, 3706352.48
62. SWEET Site 53	484824.12, 3706352.48
63. SWEET Site 54	484824.12, 3706352.48
64. SWEET Site 55	484824.12, 3706352.48
65. SWEET Site 56	484824.12, 3706352.48
66. SWEET Site 57	484824.12, 3706352.48
67. SWEET Site 58	484824.12, 3706352.48
68. SWEET Site 59	484824.12, 3706352.48
69. SWEET Site 60	484824.12, 3706352.48
70. SWEET Site 61	484824.12, 3706352.48
71. SWEET Site 62	484824.12, 3706352.48
72. SWEET Site 63	484824.12, 3706352.48
73. SWEET Site 64	484824.12, 3706352.48
74. SWEET Site 65	484824.12, 3706352.48
75. SWEET Site 66	484824.12, 3706352.48
76. SWEET Site 67	484824.12, 3706352.48
77. SWEET Site 68	484824.12, 3706352.48
78. SWEET Site 69	484824.12, 3706352.48
79. SWEET Site 70	484824.12, 3706352.48
80. SWEET Site 71	484824.12, 3706352.48
81. SWEET Site 72	484824.12, 3706352.48
82. SWEET Site 73	484824.12, 3706352.48
83. SWEET Site 74	484824.12, 3706352.48
84. SWEET Site 75	484824.12, 3706352.48
85. SWEET Site 76	484824.12, 3706352.48
86. SWEET Site 77	484824.12, 3706352.48
87. SWEET Site 78	484824.12, 3706352.48
88. SWEET Site 79	484824.12, 3706352.48
89. SWEET Site 80	484824.12, 3706352.48
90. SWEET Site 81	484824.12, 3706352.48
91. SWEET Site 82	484824.12, 3706352.48
92. SWEET Site 83	484824.12, 3706352.48
93. SWEET Site 84	484824.12, 3706352.48
94. SWEET Site 85	484824.12, 3706352.48
95. SWEET Site 86	484824.12, 3706352.48
96. SWEET Site 87	484824.12, 3706352.48
97. SWEET Site 88	484824.12, 3706352.48
98. SWEET Site 89	484824.12, 3706352.48
99. SWEET Site 90	484824.12, 3706352.48
100. SWEET Site 91	484824.12, 3706352.48
101. SWEET Site 92	484824.12, 3706352.48
102. SWEET Site 93	484824.12, 3706352.48
103. SWEET Site 94	484824.12, 3706352.48
104. SWEET Site 95	484824.12, 3706352.48
105. SWEET Site 96	484824.12, 3706352.48
106. SWEET Site 97	484824.12, 3706352.48
107. SWEET Site 98	484824.12, 3706352.48
108. SWEET Site 99	484824.12, 3706352.48
109. SWEET Site 100	484824.12, 3706352.48

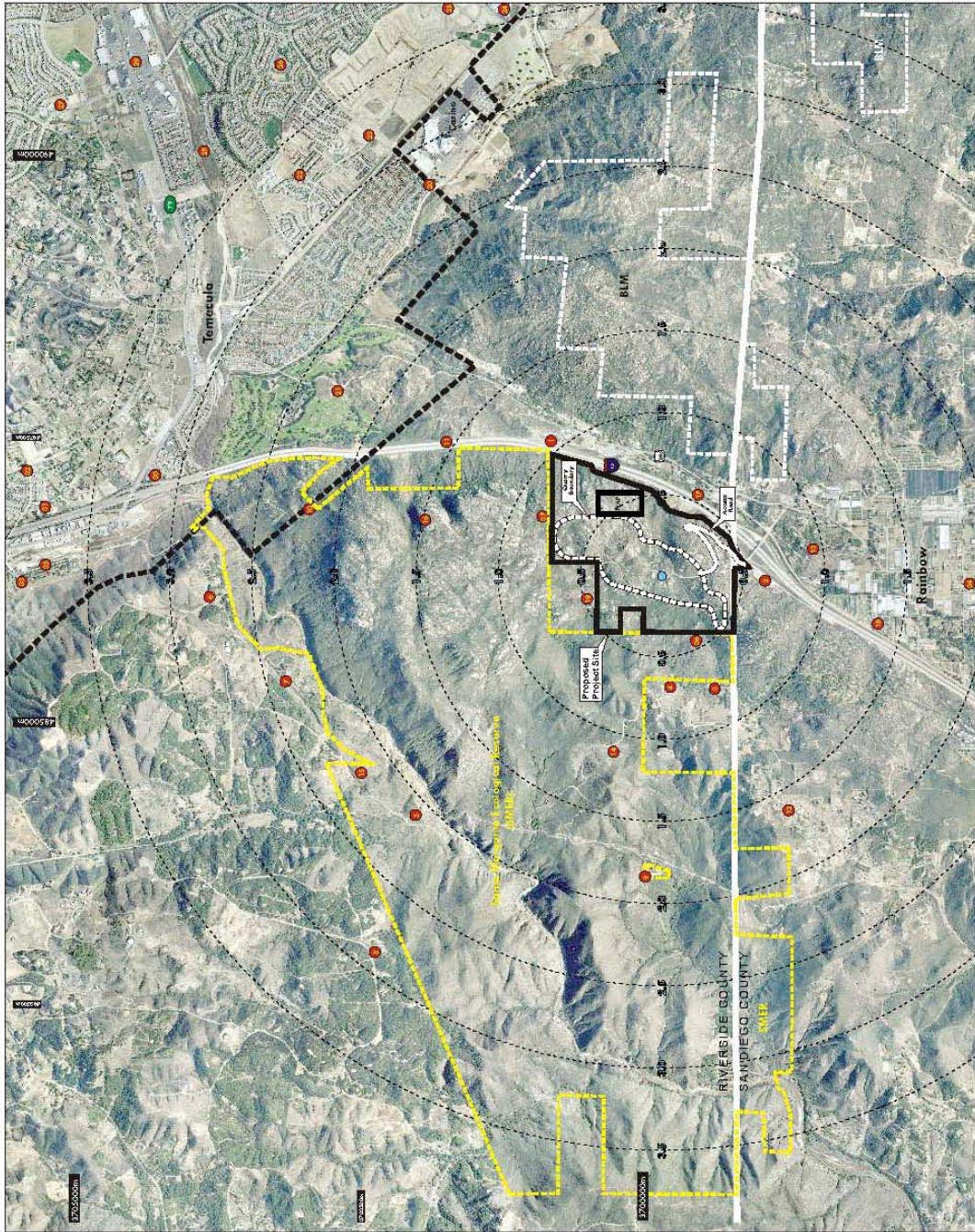


Figure 1

Ambient noise measurements were conducted in terms of A-weighted sound pressure levels (sound levels) in decibels re: 20 micropascals, using ANSI Slow meter response². A-weighted sound pressure levels are well correlated with human response to the loudness and pitch of sounds, and are commonly used to assess the reaction of people to environmental noise.

Noise measurements were performed using Larson Davis Model 820 precision integrating sound level meters fitted with Bruel & Kjaer (B&K) Type 4176 microphones and random incidence correctors. The microphones were protected with B&K windscreens, and were mounted on booms or tripods at a height of about 5 feet above ground, in a vertical orientation. The sound level meters were calibrated before use with a B&K Type 4230 acoustical calibrator certified by its manufacturer to be consistent with reference sound pressure levels maintained by the National Bureau of Standards.

Weather during the July 13-21, 2005, measurement period was hot and dry, with daytime high temperatures over 100 degrees F. During the week of July 22-29, 2005, daytime temperatures were in the range of 85 to 95 degrees F, and humidity remained low to moderate.

Ambient Noise Measurement Sites:

Measurement site 1 was located on the Santa Margarita Ecological Reserve (SMER) near the south boundary (Receptor 14). This site is located in unincorporated Riverside County. Given the close proximity and similar topography, this site reasonably represents ambient noise levels in the residential area in the valley south of the SMER and west of the project site. The noise measurements were conducted from July 13 to July 21, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-1 through B-7. Appendix C lists all of the hourly noise measurement data.

Measurement site 2 was located on the SMER near the north boundary (Receptor 15). This site is located in unincorporated Riverside County. Given the close proximity and similar topography, this measurement site reasonably represents ambient noise levels in the residential area north of the SMER and north-northwest of the project site. The noise measurements were conducted from July 13 to July 21, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-8 through B-14. Appendix C lists all of the hourly noise measurement data.

Measurement site 3 was the Cellular Tower located near the east SMER boundary (Receptor 10). This site is located within the City of Temecula, although it is located on the edge of the City boundary. Based on proximity and topography, this site reasonably represents ambient noise levels in the portion of the SMER near I-15, immediately north of the project site. (The microphone was actually placed about 500 feet south of the cellular tower, but the tower provides a convenient visual reference.) The noise measurements were conducted from July 13 to July 21, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-15 through B-21. Appendix C lists all of the hourly noise measurement data.

² Refer to Appendix A for additional definitions of acoustical terminology.

Measurement site 4 was located at the rear property line of the residences at 47725 Rainbow Valley Road (Receptor 17). This site is adjacent to I-15, within unincorporated Riverside County, and it represents the levels and temporal distribution of noise due to traffic on I-15 and ambient noise levels east of the project site. The noise measurements were conducted from July 13 to July 21, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-22 through B-28. (On July 18, 2005, noise levels were unusually high between 4 and 6 a.m., due to unknown causes; these anomalous readings were not used in the analysis in this report.) Appendix C lists all of the hourly noise measurement data.

Measurement site 5 was located at the side yard of the residence at 2658 Huffstatler Road in Rainbow Valley (Receptor 18). This site is located in unincorporated Riverside County, and it represents ambient noise sources, including distant traffic on I-15, and local agricultural activities in the area south of the project site. This home is typical of several in the Rainbow Valley area in terms of I-15 traffic noise exposures, and is relatively close to the project site. The noise measurements were conducted from July 21 to July 29, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-29 through B-35. Appendix C lists all of the hourly noise measurement data.

Measurement site 6 was located within the northwest corner of the project site, immediately adjacent to a residentially-zoned parcel that could be affected by noise associated with the project (Receptor 19). This site is located in unincorporated Riverside County and represents the ambient noise levels immediately west-northwest of the project site. The noise measurements were conducted from July 21 to July 29, 2005. A graphical illustration of the hourly noise level statistics for this site is provided by Appendix B, Figures B-36 through B-42. Appendix C lists all of the hourly noise measurement data.

Measurement site 7 was located in the public right-of-way across the street from 31320 Via Eduardo, adjacent to the Pechanga Casino (Receptor 20). This site is located within the City of Temecula and represents ambient noise levels in southern Temecula northeast of the project site. Ambient noise levels at this location were dominated in daytime by distant traffic on I-15, and local use of air conditioning equipment (HVAC) at homes and at the casino. Overflights by general aviation aircraft and military aircraft also contributed to the daytime ambient noise levels. At nighttime, ambient noise levels were affected by local HVAC use, but background noise levels were dominated by insects. Figures B-43 and B-44 in Appendix B illustrate the ambient noise levels observed during the measurement periods. Additional data are provided in Appendix C.

Measurement site 8 was located adjacent to Rainbow Valley Road, between the golf course and a group of residences that could have line of sight to some project activities (Receptor 21). This site is located within the City of Temecula and represents ambient noise levels in southern Temecula north-northeast of the project site. The background noise levels during daytime were due to distant traffic on I-15; the background noise levels at nighttime were due to insects. Average and maximum noise levels were due to traffic on Rainbow Valley Road, about 50 feet away. Figures B-45 and B-46 in Appendix B illustrate the ambient noise levels observed during the measurement periods. Additional data are provided in Appendix C.

Measurement site 9 was located in the parking lot at 28816 Pujol Road, adjacent to the Community Center (Receptor 35). This site is located within the City of Temecula and represents ambient noise levels in Temecula north of the project site. Daytime ambient noise sources included local traffic, garbage trucks and distant traffic on I-15. At nighttime, ambient noise levels were dominated by traffic on I-15, with crickets and HVAC units also being audible. Figures B-47 and B-48 in Appendix B illustrate the ambient noise levels observed during the measurement periods. Additional data are provided in Appendix C.

**TABLE II
 AMBIENT NOISE LEVEL DATA
 Project Vicinity**

Ambient Measurement Site	Receptor Location	Description	Day-Night Level (Ldn), dB	Leq ¹ dBA		Lmax dBA	
				Day	Night	Day	Night
M1	14	SMER Site 1	49.8	47	47	61	54
M2	15	SMER Site 2	52.5	48	48	61	55
M3	10	Cellular Tower	55.5	51	51	63	59
M4	17	47725 Rainbow Valley Road	64.6	59	60	75	73
M5	18	2658 Huffstatler	61.2	59	57	70	65
M6	19	Project Site Boundary	51.3	46	47	60	53
M7	20	31320 Via Eduardo	52 ²	48	45	63	52
M8	21	Rainbow Valley Road	62 ²	57	55	69	67
M9	35	28816 Pujol Road	61 ²	56	55	68	61

¹ – One-hour L_{eq} or 10-minute L_{eq}.
² – Estimated; see Appendix C.

Traffic Noise:

The dominant existing noise source in the project vicinity is traffic on I-15. The temporal distribution of I-15 traffic noise is demonstrated by Appendix B, Figures B-22 through B-28. In general, traffic noise levels are highest in working hours after 5 a.m., and lowest from midnight to 4 a.m. The highest traffic noise level occurs between 5 and 6 a.m., due to relatively high hourly traffic volumes and free-flowing traffic. Noise levels at a reference distance along the course of the highway will vary due to differences in the topography of the adjacent lands, and the height of the roadway relative to the receivers.

Noise levels due to traffic on I-15 were predicted using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model is an analytical method that has long been favored for traffic noise prediction by state and local agencies, and has been applied to numerous federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO (California/Nevada) noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to

determine the day/night distribution of traffic and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

For the traffic noise impact analysis, it was assumed that a representative noise exposure would occur at a reference distance of 150 feet from the centerline of I-15, which roughly corresponds to the nearest residential receivers. The Annual Average Daily Traffic (AADT) volume for existing conditions (year 2005) was 136,000 vehicles, and truck mix was assumed to be 2.5% medium trucks and 4.25% heavy trucks, based upon Caltrans traffic counts near the project site in 2005. Day-night distribution of traffic noise was assumed to be 62%/38% for existing conditions, based on the ambient noise measurement results at 47725 Rainbow Valley Road. In order to conservatively estimate traffic-related noise, average vehicle speed was assumed to be 65 mph.

Table III lists the traffic noise modeling results for existing conditions in terms of the Day-Night Level (L_{dn}).

Predicted L_{dn} , dB, at 150 feet from I-15 Centerline				Distances from I-15 Centerline to L_{dn} Contours, feet			
Autos	Medium Trucks	Heavy Trucks	Total	75 dB	70 dB	65 dB	60 dB
77.3	67.8	73.6	79.2	286	616	1,326	2,857

The predicted distances to the L_{dn} 60 dB and 65 dB contours indicate that the noise from traffic on I-15 dominates the noise environment at receivers located along its length. Exceptions may occur in areas where the freeway is elevated (where receivers are below the roadway, and shielded from it), and in areas where topography or buildings block line of sight from the freeway to the receiver. In those cases, traffic noise levels will be reduced by 5 to 10 dB. Nonetheless, the noise levels produced by traffic on I-15 are high, and they affect land use compatibility within about ½ mile of the roadway. This is further illustrated by the measured noise levels in the range of 65 dB L_{dn} that were measured at 47725 Rainbow Valley Road (Ambient Measurement Site 4 [Receptor Location 17]), which was at the edge of the freeway right-of-way, at the toe of the slope below I-15.

The noise measurement data at measurement site 4 indicated that the average hourly noise level (L_{eq}) due to traffic on I-15 during the quietest hour of the night was about 13 dB lower than the measured daily L_{dn} value. Using this relationship, it is possible to estimate the distance at which the average noise level due to I-15 traffic would be about 45 dB during the quietest hour of the night. Referring back to Table 4.9-3 for reference L_{dn} values, and using the FHWA model assumptions for traffic noise attenuation over distance, the estimated distance to the 45 dB L_{eq} traffic noise contour during the quietest hour of the night is about 4,000 feet from the I-15 centerline. This result indicates that ambient noise levels within about ¾ of a mile from I-15 may be strongly influenced by the noise of traffic on I-15.

REGULATORY SETTING

State

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. A significant effect from noise may exist if a project would:

- Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies,
- Result in exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels,
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, or
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Local Standards

Local jurisdiction standards include the General Plan Noise Elements of Riverside County, San Diego County, and the City of Temecula, as well as noise control ordinances adopted by Riverside County and San Diego County. The Western Riverside Multiple Species Habitat Conservation Plan (“MSHCP”) provides additional noise standards. In addition, the jurisdictions have adopted specific noise standards for construction.

General Plan Elements and Plans

Riverside County Noise Element

The relevant policies are listed below:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used. (AI 107)

N 1.2 Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports. (AI 107)

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools;
- Hospitals;
- Rest Homes;
- Long Term Care Facilities;
- Mental Care Facilities;

- Residential uses;
- Libraries;
- Passive Recreation Uses; and
- Places of worship

N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys. (AI 106, 109)

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County. (AI 105, 106, 108)

N 1.6 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise-sensitive uses. (AI 107)

N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem. (AI 106, 107)

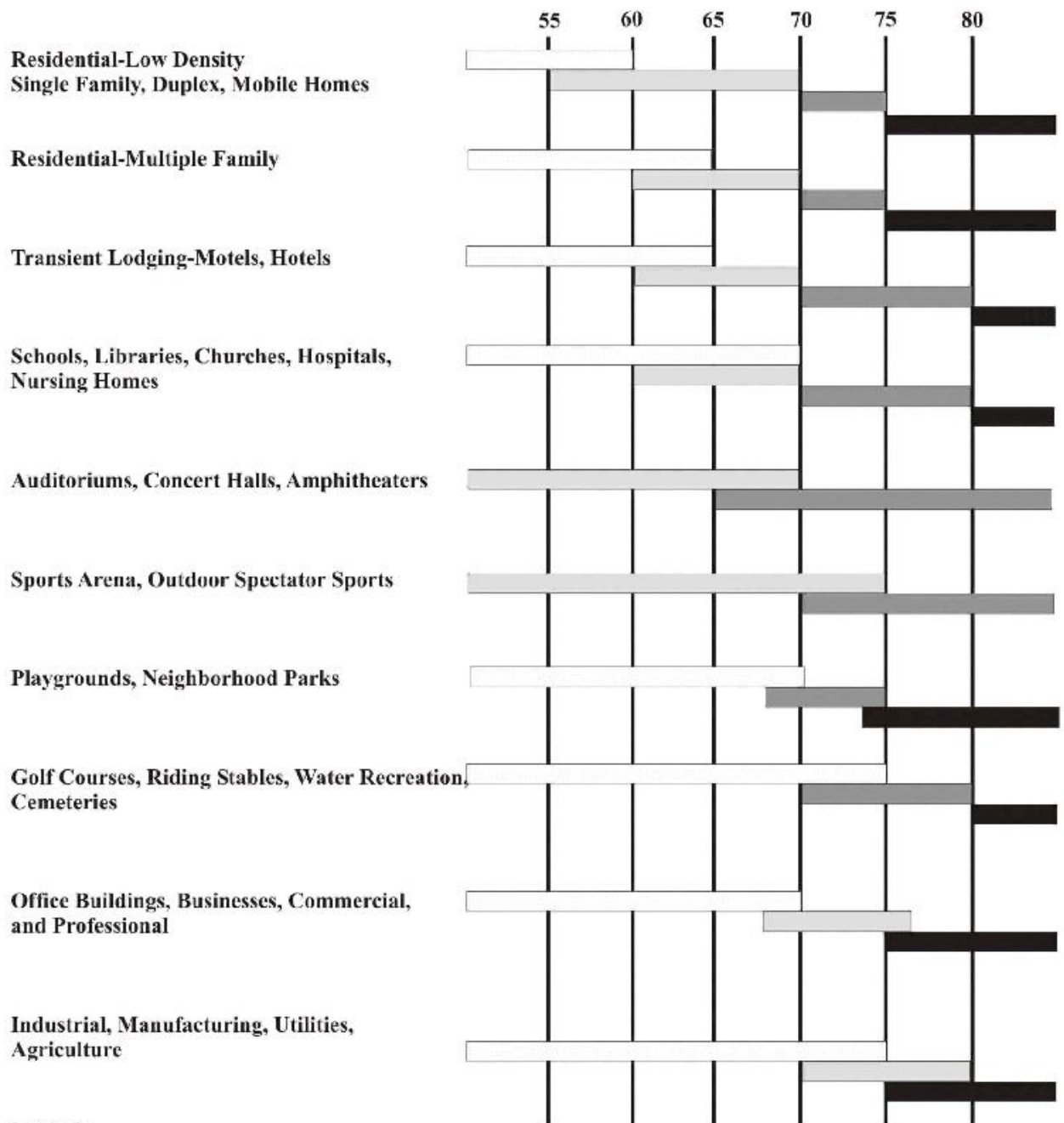
N 1.8 Limit the maximum permitted noise levels that cross property lines and impact adjacent land uses, except when dealing with noise emissions from wind turbines. (AI 108)

The Riverside County General Plan Noise Element provides land use compatibility standards for various land uses, as shown in Table N-1.

Pursuant to Table N-1, noise exposures at proposed industrial development sites are considered “normally acceptable” to 75 dB L_{dn} , and “conditionally acceptable” to 80 dB L_{dn} .

“Conditionally acceptable” means that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

LAND USE CATEGORY **COMMUNITY NOISE EXPOSURE LEVEL Ldn or CNEL, dBA**



Legend:

- Normally Acceptable:** Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
- Conditionally Acceptable:** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.
- Normally Unacceptable:** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shaded.
- Clearly Unacceptable:** New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: California Office of Noise Control

N 2.3 Mitigate exterior and interior noises to the levels listed in the table below to the extent feasible, for stationary sources: (AI 105)

RIVERSIDE COUNTY GENERAL PLAN		
TABLE N-2		
STATIONARY SOURCE LAND USE NOISE STANDARDS ¹		
Land Use	Interior Standards	Exterior Standards
<i>Residential</i>		
10:00 p.m. to 7:00 a.m.	40 L _{eq} (10 minute)	45 L _{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L _{eq} (10 minute)	65 L _{eq} (10 minute)
¹ These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.		

The Riverside County Department of Public Health confirmed the exterior standards in a letter dated September 13, 2007. (Appendix E.)

Note that the Riverside County General Plan uses a ten-minute measurement period for the preferred L_{eq} values. Most other jurisdictions, including the County of San Diego, use a one-hour measurement period for the allowable L_{eq} values, and the one-hour measurement period is generally used by acousticians for noise impact analysis. As a practical matter, there is no difference between the one-hour L_{eq} and ten-minute L_{eq} values for the proposed project, because quarry operations and truck traffic can be expected to remain relatively constant during any given period throughout the work day.³ Therefore, this analysis uses the ten-minute measurement period terminology for the preferred L_{eq} values in Riverside County, and one-hour measurement period L_{eq} values in San Diego County.

Western Riverside (County) Multi-Species Habitat Conservation Plan (MSHCP)

“Section 6.1.4 Guidelines Pertaining to the Urban/Wildlands Interface

Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. *For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.*” (Emphasis added.)

Portions of the land uses adjacent to the site, particularly SMER, are within the MSHCP Conservation Area. Therefore, the residential noise standards will be applied at the SMER property boundary, from the perspective of wildlife present at the boundary.

³ Mining and processing equipment such as that described in Appendix D can be expected to operate continuously throughout the work day without significant variation in noise levels during any given time period. Truck traffic will vary over the course of the entire work day, but will be relatively constant during any one hour period. In other words, given the essentially uniform nature of the sound-generating activities associated with the quarry through any given time period, the “average” sound level for any one hour will be the same as that for any ten-minute period within that hour.

San Diego County Noise Element

The relevant Noise Element policies are listed below. San Diego County has also published “Guidelines for Determining Significance” that cite these policies and the provisions of the County Noise Control Ordinance. These guidelines define “Noise Sensitive Land Uses” (“NSLU”) as “Any residence, hospital, school, resort, library, or similar facility where quiet is an important attribute of the environment.” (San Diego County Guidelines, § 1.1.6.)

4.1 Noise Sensitive Land Uses (NSLU) Affected by Airborne Noise

Project implementation will result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated from the project, together with noise from roads [existing and planned Circulation Element roadways], railroads, airports, heliports and all other noise sources) in excess of any of the following:

A. Exterior Locations:

- i. 60 dB (CNEL); or
- ii. An increase of 10 dB (CNEL) over pre-existing noise.

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- (1) Net lot area up to 4,000 square feet: 400 square feet
- (2) Net lot area 4,000 sq. ft. to 10 acres: 10% of net lot area
- (3) Net lot area over 10 acres: 1 acre

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

- i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 decibels (A).
- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

City of Temecula Noise Element

The relevant City of Temecula General Plan Noise Element standards are set forth in Table N-1.

**CITY OF TEMECULA GENERAL PLAN
TABLE N-1
TEMECULA LAND/USE/NOISE STANDARDS**

Property Receiving Noise		Maximum Noise Level (Ldn or CNEL, dBA)	
Type of Use	Land Use Designation	Interior	Exterior ³
Residential	Hillside Rural Very Low Low Low Medium	45	65
	Medium	45	65/70 ¹
	High	45	70 ¹
	Neighborhood Community Highway Tourist Service	--	70
Commercial and Office	Professional Office	50	70
	Light Industrial	Industrial Park	75
Public/Institutional	Schools	50	65
	All Others	50	70
Open Space	Vineyards/Agriculture	--	70
	Open Space	--	70-65 ²

¹ Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.
² Where quiet is a basis required for the land use.
³ For aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB CNEL.

Noise Control Ordinance Standards

Riverside County

By its terms, the Riverside County Noise Ordinance is not used as a CEQA standard of significance. The project-related noise impacts and the Riverside County Noise Ordinance are discussed at the end of this report.

San Diego County

County Code Section 36.404: Sound Level Limits.

Unless a variance has been applied for and granted, it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level⁴, at any point on or beyond the boundaries of the property on which the sound is produced, exceeds the applicable limits set forth below, except that:

- (1) Construction noise level limits shall be governed by Section 36.410 of this chapter; and

⁴ Assumed to be hourly Leq.

(2) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit which authorizes the noise-generating use or activity, and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, then implementation and compliance with such noise mitigation measures shall be deemed to constitute compliance with this section.

(See San Diego County Guidelines for Determining Significance, Noise, Section 4.2.B.)

San Diego County Noise Ordinance

Zone	Time	APPLICABLE LIMIT ONE-HOUR AVERAGE SOUND LEVEL (DECIBELS)
R-S, R-D, R-R, R-MH, A-70, A- 72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
R-RO, R-C, R-M, C-30, S-86, R-V AND R-U Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
S-94 and all other commercial zones.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
M-50, M-52, M-54	Anytime	70
S-82, M-58, and all other Industrial zones.	Anytime	75

If the measured ambient level exceeds the applicable limit noted above, the allowable one hour average sound level shall be the ambient noise level. The ambient noise level shall be measured when the alleged noise violation source is not operating.

The sound level limit at a location on a boundary between two (2) zoning districts is the arithmetic mean of the respective limits for the two districts; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone where the extractive industry is actually located. (San Diego County Guidelines for Determining Significance, Noise, Section 4.2.A.)

City of Temecula

The City of Temecula has not adopted a quantitative noise control ordinance.

Construction Noise Standards

Riverside County

County Code Section 15.04.020: General Regulations

F. Construction noise.

1. Whenever a construction site is within one-quarter of a mile of an occupied residence or residences, no construction activities shall be undertaken between the hours of six p.m. and six a.m. during the months of June through September and between the hours of six p.m. and six a.m. during the months of October through May. Exceptions to these standards shall be allowed only with the written consent of the building official.
2. The generation of construction noise other than as permitted in subsection (F)(1) of this section, shall be a violation of this title, and the building official or his or her designee shall have the authority to undertake enforcement actions in accordance with the procedures, remedies and penalties for violations as provided for in Riverside County Ordinance No. 725 (Chapter 1.16 of this code), which is incorporated into this chapter by reference.

San Diego County

Section 36.410 of the County Code states:

Except for emergency work,

- (a) It shall be unlawful for any person to operate construction equipment between the hours of 7 p.m. of any day and 7 a.m. of the following day.
- (b) It shall also be unlawful for any person to operate construction equipment on Sundays, and days appointed by the President, Governor, or the Board of Supervisors for a public fast, Thanksgiving, or holiday, but a person may operate construction equipment on the above-specified days between the hours of 10 a.m. and 5 p.m. at his residence or for the purpose of constructing a residence for himself, provided that the average sound level does not exceed 75 decibels during the period of operation and that the operation of construction equipment is not carried out for profit or livelihood.
- (c) It shall also be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property upon which a legal dwelling unit is located an average sound level greater than 75 decibels between the hours of 7 a.m. and 7 p.m. (Amended by Ord. No. 9700 (N.S.), effective 2-4-05). For construction activities, the County considers the 75 decibel (A) average to be based on a period of one hour.

The San Diego County “Guidelines for Determining Significance” state:

“For purposes of materials handling and impact equipment noise assessments, "temporary" is defined as one month of operation, or 240 hours, within 3 consecutive calendar months. *Any material handling or impact equipment in continuous operation longer than this period may be considered an operation and would no longer be covered under the noise construction*

ordinance. Evaluation of construction work is dependent on the project site and its situation (i.e., fixed or mobile sources, proximity to other land uses, and type of noise source).” (San Diego County Guidelines for Determining Significance, Noise, Page 1, footnote 1.)

City of Temecula

Section 8.32.020 of the Municipal Code: Construction restricted.

Notwithstanding any provision of the city Ordinance No. 90-04, and specifically subsection G(1) of Riverside County Ordinance No. 457.73, during such time as this ordinance is in full force and effect, no person shall engage in or conduct construction activity, when the construction site is within one-quarter mile of an occupied residence, between the hours of six-thirty p.m. and six-thirty a.m., Monday through Friday, and shall only engage in or conduct construction activity between the hours of seven a.m. and six-thirty p.m. on Saturday. Further, no construction activity shall be undertaken on Sunday and nationally recognized holidays. Public works projects of any federal, state or local entity or emergency work by public utilities are exempt from the provisions of the ordinance codified in this chapter. Residents working on their homes or property are exempt from the prohibition of construction activities on Sundays and holidays but must comply with the hourly restrictions set forth for Saturday when working on Sundays and holidays. The city council may, by formal action, exempt projects from the provisions of this chapter. (Ord. 94-25 § 2)

Riverside Co. Ord. 457.73 *as cited by the City of Temecula*

G. Construction Noise.

1. Whenever a construction site is within one-quarter (1/4) of a mile of an occupied residence or residences, no construction activities shall be undertaken between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. Exceptions to these standards shall be allowed only with the written consent of the building official.
2. The generation of construction noise other than as permitted in Section 1.G.1 of this Ordinance, shall be a violation of this Ordinance, and the building official or his designee shall have the authority to undertake enforcement actions in accordance with the procedures, remedies and penalties for violations as provided for in Riverside County ordinance no. 725, which is incorporated herein by reference.

CRITERIA FOR DETERMINING SIGNIFICANCE

CEQA Guidelines

Under Appendix G of the CEQA Guidelines, adverse impacts related to noise are considered significant if the proposed project would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other federal or state agencies.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, or
- Result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels⁵.

Because the proposed project may cause noise impacts at receptor locations throughout unincorporated Riverside County, unincorporated San Diego County, and the City of Temecula, the noise impacts are evaluated based on the applicable standards for each jurisdiction. These significance criteria are based on the regulatory background described above.

Riverside County Receptor Locations

L_{eq} Standards

- During daytime hours (7 a.m. to 10 p.m.), the property line standard for residential uses in unincorporated Riverside County is 65 dB L_{eq} (10-minute)
- During nighttime hours (10 p.m. to 7 a.m.), the property line standard for residential uses in unincorporated Riverside County is 45 dB L_{eq} (10-minute)⁶

Land Use Compatibility (L_{dn}) Standards

- Under the Riverside County General Plan, the maximum acceptable noise exposure for the industrial portion of the project site is 75 dB L_{dn} , although noise levels may be conditionally acceptable to 80 dB L_{dn} . For neighboring residential-low density, single family, duplex, and mobile home land uses, the maximum acceptable exterior noise exposure is 60 dB L_{dn} , although noise levels may be conditionally acceptable to 70 dB L_{dn} . A proposed project resulting in a conditionally acceptable land use compatibility noise exposure must undergo a noise analysis and implement noise attenuation features.

⁵ Project-related ground-borne vibration and ground-borne noise impacts have been analyzed in a separate report prepared by Vibra-Tech Engineers (2007).

⁶ As described in the Regulatory Background section above, the various jurisdictions also have interior noise level standards for residential and other noise sensitive land uses that typically range between 15 – 20 dB below the exterior standards. Residential construction of any type typically provides noise level reduction of around 20 – 25 dB. If the project meets the exterior residential standards, it can be assumed that the project will also meet the interior residential standards. Therefore, the interior noise levels have not been included in this analysis.

MSHCP Standard

- The Western Riverside MSHCP provides that Riverside County standards for residential uses apply to lands within the MSCHP Conservation Area. This applies to the Santa Margarita Ecological Reserve lands located adjacent to the property to the north.

San Diego County Receptor Locations

L_{eq} Standards

- During daytime hours (7 a.m. to 10 p.m.), the property line standard for residential uses in unincorporated San Diego County is 50 dB L_{eq} (one-hour); however, if the measured ambient level exceeds the applicable property line standard, the allowable one hour average sound level shall be the ambient noise level. This applies to all San Diego County Receptor Locations except Receptor Location 2.
- During nighttime hours (10 p.m. to 7 a.m.), the property line standard for residential uses in unincorporated San Diego County is 45 dB L_{eq} (one-hour); however, if the measured ambient level exceeds the applicable property line standard, the allowable one hour average sound level shall be the ambient noise level. This applies to all San Diego County Receptor Locations except Receptor Location 2.
- During daytime hours (7 a.m. to 10 p.m.), the property line standard for Receptor Location 2 is 67.5 dB L_{eq} (one-hour);⁷ however, if the measured ambient level exceeds the applicable property line standard, the allowable one hour average sound level shall be the ambient noise level.
- During nighttime hours (10 p.m. to 7 a.m.), the property line standard for Receptor Location 2 is 65 dB L_{eq} (one-hour);⁸ however, if the measured ambient level exceeds the applicable property line standard, the allowable one hour average sound level shall be the ambient noise level.

Land Use Compatibility (L_{dn}) Standards

- “Noise Sensitive Land Uses” (residences, hospitals, schools, resorts, libraries, or similar land uses affected by noise) within San Diego County shall not be exposed to exterior noise levels of 60 dB (CNEL), or an increase of 10 dB CNEL over ambient noise levels.

⁷ Receptor Location 2 lies on the property boundary between two (2) zoning districts, and under the San Diego County Guidelines for Determining Significance the applicable sound level limit is the arithmetic mean of the respective limits for the two districts. The parcel where Receptor 2 is located is zoned for freeway commercial (C-44) uses, and the applicable one-hour sound level limit for daytime hours is 60 dB L_{eq} . The applicable sound level limit applicable to extractive industries, including mines, is 75 dB at the property line regardless of the zone where the extractive industry is actually located. The San Diego portion of the project site happens to be zoned A-70, but the 75 dB limit applies given the nature of the project.

⁸ This is the arithmetic mean between the applicable nighttime standard for freeway commercial (C-44) zoning uses (55 dB) and the standard applicable to extractive industries (75 dB). See previous footnote for additional discussion.

City of Temecula Receptor Locations

L_{eq} Standards

- The City of Temecula does not have an established L_{eq} standard. For purposes of this analysis, the Riverside County L_{eq} standard described above shall apply to Receptor Locations within the City of Temecula.

Land Use Compatibility (L_{dn}) Standards

- For all land uses in the City of Temecula, the maximum acceptable exterior noise level is 65 dB L_{dn}.⁹
- For all land uses in the City of Temecula, the maximum acceptable interior standard is 45 dB L_{dn}.

Construction Noise Standards – All Jurisdictions

- In Riverside County and in the City of Temecula, construction activities within ¼ mile of occupied residences are limited to the hours of 6 a.m. to 6 p.m. In San Diego County, construction activities are limited to 7 a.m. to 7 p.m. Construction activities taking place outside of these hours would be considered to be a significant impact.
- San Diego County also applies a construction-related sound level standard of 75 dB L_{eq} at the property line of any legal dwelling.

Measures of Changes in Ambient Noise Levels for Noise Sensitive Land Uses

One of the key criteria for determining the significance of project-related noise under CEQA is whether the project will cause substantial permanent or temporary increases in ambient noise levels in the project vicinity. Riverside County and the City of Temecula have not established significance criteria for increases in ambient noise levels. San Diego County considers an increase of 10 dB CNEL over pre-existing noise levels for “Noise Sensitive Land Uses” (defined above) to be a significant impact.

The Liberty Quarry project may increase ambient noise levels in two ways, either through noise generated by onsite equipment and vehicles, or through offsite vehicular traffic on Interstate 15. These mechanisms will be analyzed separately, and are subject to slightly different significance criteria.

1. Changes in Ambient Noise Levels for Noise Sensitive Land Uses caused by Onsite Activities

For non-transportation noise sources affecting noise sensitive land uses, many jurisdictions consider an increase in ambient noise levels of greater than 5 dBA to be potentially significant.

⁹ Note that the City of Temecula actually allows higher exterior noise levels for some land uses; this level is the most conservative exterior noise level is 65 dB L_{dn}, and thus serves as the CEQA standard of significance.

This amount of change in environmental noise levels is considered to be noticeable by most people, and has the potential to result in annoyance when people notice that noise levels where they live have increased. Increases of less than 3 dBA are generally imperceptible by most people. Therefore, for changes in project-related, non-transportation noise sources affecting places where people live, the threshold of significance will be changes greater than 5 dB CNEL/ L_{dn} or 5 dB L_{eq} . There are no data to indicate that wildlife is adversely affected by changes in ambient noise levels. Therefore, this criterion will only be applied to changes in noise levels affecting places where people live, within the noise sensitive land uses as defined below.

For purposes of this report, the term “noise sensitive land use” is defined in accordance with the San Diego County Guidelines to mean “Any residence, hospital, school, resort, library, or similar facility where quiet is an important attribute of the environment.” (San Diego County Guidelines, § 1.1.6.)

2. Changes in Ambient Noise Levels caused by Offsite Transportation Activities.

The 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations, provides guidance as to the significance of changes in ambient noise levels caused by offsite transportation activities. The FICON findings are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON findings is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn} or CNEL. The changes in transportation-caused noise exposure that are shown in Table IV are expected to result in equal changes in annoyance at noise sensitive land uses.

TABLE IV POTENTIALLY SIGNIFICANT INCREASES IN CUMULATIVE NOISE EXPOSURE FOR TRANSPORTATION NOISE SOURCES	
Ambient Noise Level Without Project (L_{dn} or CNEL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON), 1992, as applied by Brown-Buntin Associates, Inc.	

This standard will be applied to increases in ambient noise levels at noise sensitive land uses caused by project-related offsite truck traffic on Interstate 15.

PROJECT NOISE IMPACT ANALYSIS

Quarry Operations

The project noise impact analysis for the Liberty Quarry applied measured noise levels and frequency content of representative noise sources to the Environmental Noise Model (ENM). The ENM is a commercially-available noise propagation model that accepts input of noise levels and frequency content for a number of sources, located on a topographic base map of the project vicinity. The ENM then predicts noise propagation in term of noise levels at selected receivers, or in terms of noise contours, accounting for the effects of atmospheric and ground absorption of sound, and of the shielding provided by topography.

The ENM accounts for total atmospheric attenuation and barrier insertion loss by calculating the following individual attenuation components:

- Geometric spreading
- Enclosures
- Barriers
- Air absorption
- Wind effects
- Temperature gradient effects
- Ground effects
- Shielding by vegetation and buildings

Appendix F provides a detailed description of the methods and algorithms used by the ENM.

Noise level data for the sources to be used at the Liberty Quarry were obtained from noise measurements conducted in 2005 at the existing Granite Construction aggregate and asphalt plant in Indio, California. Additional noise measurements were made for generator sets (gensets) in Banning, California, and a gyratory and enclosed crushers at Colton, California, in 2007. Certain other data were obtained from Brown-Buntin Associates, Inc. file data.

The equipment used for the noise measurements in 2005 and 2007 was a Larson Davis Model 824 precision integrating sound level meter and frequency analyzer fitted with a Larson Davis Model 2541 free-field microphone, meeting the specifications of the American National Standards Institute (ANSI) for Type 1 sound measurement systems. The noise measurement system was calibrated before use with a Larson Davis Model CA-250 acoustical calibrator, certified by its manufacturer to be consistent with reference values maintained by the National Bureau of Standards.

To prepare the data for use in the ENM, the measured noise levels were entered into the ENM in terms of octave band sound pressure levels, referring to the measurement distance. The ENM was then calibrated for each source to predict the same values as were measured in the field. For most noise sources, the data were entered as hourly equivalent noise levels (L_{eq}). For sound sources that were not continuous in nature, such as passing trucks, the data were entered as

Sound Exposure levels (SEL), and adjustments were made to derive the L_{eq} based upon the projected numbers of operations per hour at the Liberty Quarry.

The project proposes to incorporate the following site engineering and certain noise mitigation measures into the site design which are taken into account while assessing the potential noise impacts of the project. Specifically, the following assumptions were made:

- The excavations and process plant locations are designed to utilize the surrounding ridgelines and on-site setbacks to limit noise from mining activities and the processing plants.
- The processing plants will be constructed on an excavated building pad of 1,670 to 1,700 feet msl to lower the profile of the plants as well to limit off-site noise.
- A landscaped berm, minimum 25 feet in height, will be constructed on the southwest side of the plant area to limit off-site noise.
- Crushers and screens at the aggregate, concrete batch and recycling plants would be enclosed to satisfy air quality requirements;
- Concrete and asphalt truck loading operations would be partially shielded by the “tunnel” structures under the concrete and asphalt batch plants;
- The baghouse exhaust fans would be fitted with 5-foot length silencers;
- Gensets and heavy mobile equipment would be fitted with adequate mufflers and engine enclosures consistent with the equipment for which the reference noise measurements were made; and
- Mining activities would be set back at least 400 feet from the north project boundary.

Appendix D summarizes the noise measurement data and operational assumptions used for this analysis.

To provide a topographic base map for the ENM, BBA relied upon the project topography maps for the various project phases, as well as upon USGS topographic maps. BBA staff created AutoCAD files incorporating these data, and then converted the maps into the ENM map format, adding assumptions about ground absorption characteristics.

The noise sources were placed on the ENM base map at representative heights above the ground surface, based upon the project design, and upon the equipment observed at Indio and other similar project sites. Receiver heights were assumed to be 1.5 meters (5 feet) above ground level.

The receiver sites selected for this analysis include the Ambient Measurement Sites described above, as well as additional locations selected from the overall list of Receptor Locations used for the environmental analysis (Figure 1). The receiver sites were chosen to provide a broad range of land use types and locations within each of the relevant jurisdictions. Together, these receiver sites adequately describe project-related noise impacts in the region surrounding the project site.

The distances from noise sources to receivers vary by scenario, as can be seen in the plan submitted for each mining phase. For example, the concrete batch plant location remains the same from the beginning of the project to Phase 2, but is moved in Phase 3. The assumed

locations of the mining activities are given in the report. In general, the following distances may be assumed for the nearest sensitive receivers:

- Property Line to Receptor 3: 1490 feet; 50 feet more to the quarry in Phases 1 & 3;
- Nearest property line to Receptor 4, due east: about 1,300 feet; however, it is 2,065 feet to the quarry footprint; Receptor 4 is also 2,060 feet to the quarry to its southeast;
- Receptor 17 on east and east of I-15: about 750 feet from property line; 860 feet from access road; and 1,825 feet from quarry rim.

The specific receiver sites and applicable jurisdictions used in this analysis are as follows:

TABLE VI NOISE ANALYSIS RECEIVER SITES		
Receptor Location	Description	Jurisdiction
2	Rainbow Exit Weigh Station	San Diego County
3	Rainbow Glen Residence	Riverside County
4	Rainbow Glen Residence	Riverside County
7	Temecula Residence	Riverside County
10	Cellular Tower	City of Temecula
12	Fallbrook Residence	San Diego County
14	SMER Site 1	Riverside County
15	SMER Site 2	Riverside County
16	SMER Site 3	Riverside County
17	47725 Rainbow Valley Rd.	Riverside County
18	2658 Huffstatler, Rainbow	San Diego County
19	Adjacent Private Property	Riverside County
20	31320 Via Eduardo	City of Temecula
21	Rainbow Valley Road	City of Temecula
35	28816 Pujol	City of Temecula
36	SMER-North Project Boundary	Riverside County
37	SMER-West Project Boundary	Riverside County

Figure 2 shows the noise analysis receiver sites on a project base map.

Ambient noise levels were assigned to each receptor site based upon the noise measurement results obtained at the nearest representative Ambient Measurement Site (see Table VII). This method allows comparison of predicted project-related and representative ambient noise levels.

**TABLE VII
 AMBIENT HOURLY NOISE LEVEL ASSUMPTIONS
 Liberty Quarry Project**

Receiver	Description	Ambient Leq, dB ¹	Source/Date of Ambient Measurements	Time Period	Applies to Receptor Locations
2	Rainbow Exit Weigh Station	53	Site 17	--	--
3	Rainbow Glen Residence	39	Site 14	--	--
4	Rainbow Glen Residence	39	Site 14	--	--
7	Temecula Residence	40	Site 15		
10	Cellular Tower	45	7/15/2005	1a - 4a	10, 16
12	Fallbrook Residence	39	Site 14	--	--
14	SMER Site 1	39	7/15/2005	4a - 7a	3, 4, 12, 14, 36, 37
15	SMER Site 2	40	7/20/2005	5a - 8a	7, 15
16	SMER Site 3	45	Site 10	--	--
17	47725 Rainbow Valley Rd.	53	7/19/2005	12a - 3a	2, 17
18	2658 Huffstatler, Rainbow	51	7/24/2005	2a - 5a	18
19	Adjacent Private Property	34	7/28/2005	5a - 8a	19
20	31320 Via Eduardo	44*	7/21/2005	10p	20
21	Rainbow Valley Road	49*	7/21/2005	10p	21
35	28816 Pujol	54*	7/21/2005	11p	35
36	SMER-North Project Boundary	39 ²	Site 14	--	--
37	SMER-West Project Boundary	39	Site 14	--	--

* - The lowest measured L50 value was used for the short-term noise measurement sites.

¹ - Rounded to nearest whole number.

² - Site 36 is relatively close to Site 10, but is more shielded from I-15 traffic noise than Site 10. To provide a conservative analysis of noise effects, it was assumed that Site 36 was relatively quiet, similar to SMER Site 1.

The ENM accounts for atmospheric absorption of sound, considering the factors of temperature and relative humidity. The model also accounts for absorption of sound by the ground, and for the insertion loss of barriers and topography. The ENM can also account for the effects of wind speed and direction, and for the presence of inversions.

To be consistent with assumptions used for the air quality analysis (Kleinfelder, 2007), the available nighttime and early morning temperature and humidity assumptions were used. The temperature was taken to be 17 degrees Celsius (52 degrees Fahrenheit), and the relative humidity was taken to be 77%. Atmospheric data indicate that the average wind speed in the project vicinity is 4.5 mph (2 m/s), but the wind direction varies from northeast to southwest over the 24-hour day.

The noise level predictions made for this project assume a uniform atmosphere with no wind. It is recognized that variations in atmospheric conditions may cause the actual project noise levels to be either higher or lower than predicted by the ENM.

The effects of changes in temperature and humidity upon sound propagation are generally slight, so that variations in predicted noise levels within the range of temperature and relative humidity found in the project area would not be substantial.

Winds can affect sound propagation, generally by increasing noise levels downwind, and decreasing noise levels upwind. However, wind effects are difficult to predict reliably, as the range of wind speeds and directions experienced during even one night can be quite broad.

Similarly, inversions or wind gradients can enhance sound propagation at distances of ¼ mile or more, but the variables affecting inversion or gradient altitudes are unpredictable. Experience has shown that noise levels measured at large distances (greater than ¼ mile) from industrial noise sources can vary over a range of 5 to 10 dB when inversions are present. In some cases, the noise source may be audible at one receiver, but inaudible at another receiver closer to the source. Since the air quality analyses did not consider inversions to be of concern for the project, the noise modeling assumed that no inversion layers were present.

In the noise modeling process, the mining noise sources (power shovel, bulldozers, trucks and gyratory) were placed in the approximate center of the mining area at the beginning or end of the phase. It is recognized that this equipment may be placed at any point in the mining area, and will therefore be either closer to, or farther from, any given sensitive receiver location at different times during the quarry development. As a result, the predicted noise levels would increase or decrease as a function of distance. Similarly, the equipment may be placed closer to, or farther from, the sides of the excavation, which would either enhance or reduce the insertion loss (shielding) and consequent noise level reduction provided by the topographic barriers. Preparation of detailed noise models for all possible configurations of mining is impractical.

The noise modeling assumptions of central mining locations provide a generalized depiction of mining noise levels, based upon detailed source noise emission data. The modeled noise levels provide a reasonable basis for judging the likely noise impacts of this project, and for assessing the effects of changes in project design and operations over the life of the project.

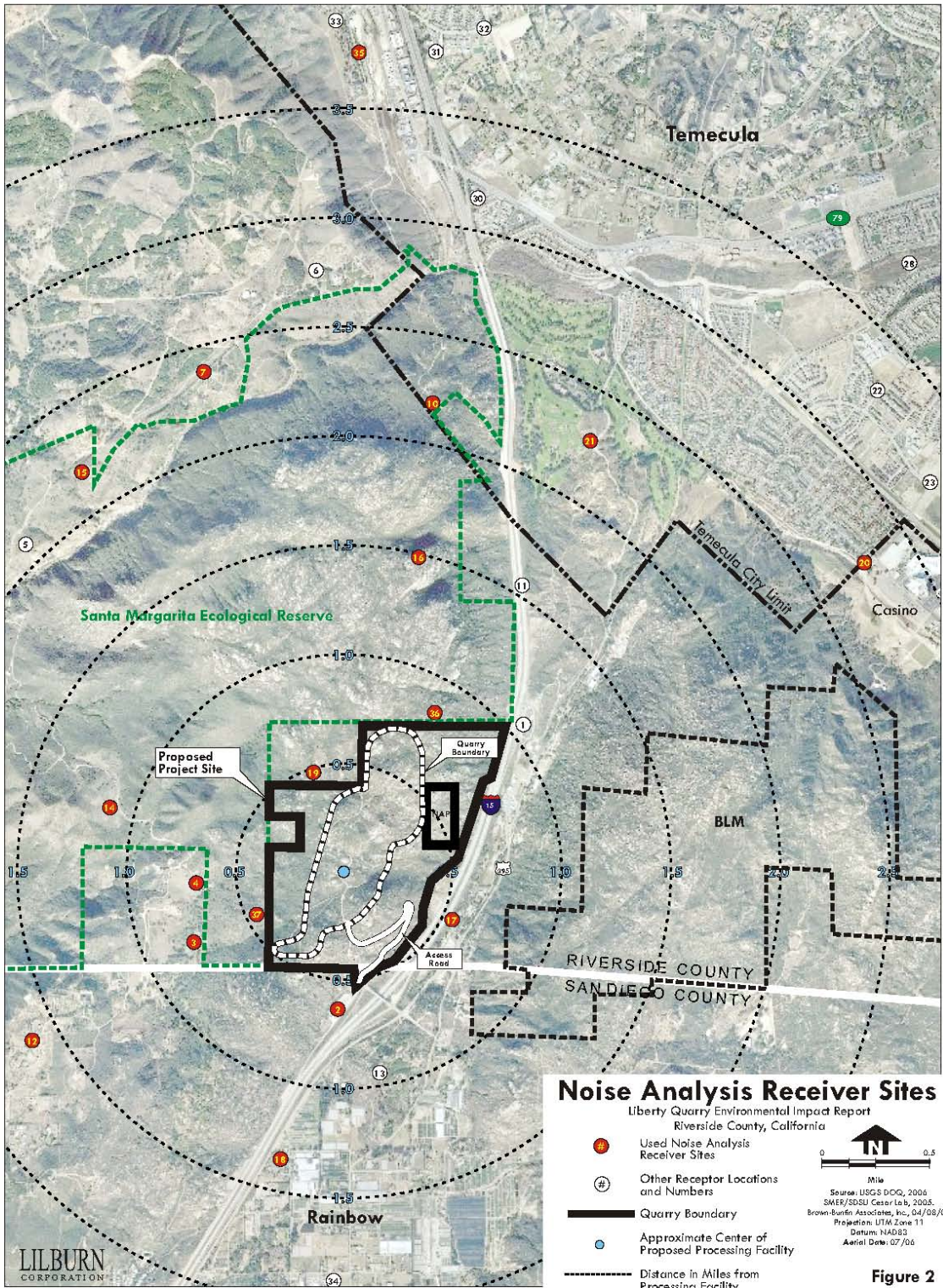


Figure 2

Four rounds of noise modeling have been completed for the Liberty Quarry using the ENM. The hours of quarry and mining operations were assumed to be from 4:00 a.m. to midnight, six days a week. The assumed locations of activities and noise sources were based upon the 2007 Mining Plan (Project Description for Liberty Quarry, April 2007). The first round (called the Initial Case) represents the early years of Phase 1. In this case, access roads are present, and the aggregate processing plant is in place. Other fixed noise sources in place include the concrete batch plant, generator sets (gensets or power plant), the recycling plant, a gyratory (crusher), and the asphalt plant. The mining noise sources were assumed to be at or the elevation of the aggregate processing plant where mining would begin, which is immediately north of the aggregate plant. The processing equipment was placed on the base map as shown by the mining plan. Mining noise sources were placed in the approximate center of the mining area.

The second case represents the last few years of Phase 1. As in the initial phase, the fixed noise sources were placed at the locations shown by the mining plan. Mining sources were placed at the lowest elevations shown by the Phase 1 plan, at the north end of the pit, to be consistent with the mining plan.

The third case represents the last few years in Phase 2. The fixed noise sources were placed at the locations shown by the mining plan. Mining sources were placed at the lowest elevations shown by the Phase 2 plan, at the north end of the pit, to be consistent with the mining plan.

The fourth case represents a period near the end of Phase 3. The aggregate processing plant was relocated to the bottom of the Phase 2 mining pit. The asphalt plant, concrete batch plant and gensets were relocated as shown by the mining plan. The recycling plant remained at its original location, but at a lower elevation. Mining sources were placed in central locations at the ending elevation to be consistent with the mining plan.

For all four cases, truck traffic on the road climbing from the freeway to the project site was modeled as a series of line sources along the roadway.

Average Noise Levels Associated with the Quarry

For each case, the ENM was run to predict average noise levels assuming that the mining and processing equipment was in continuous use, except as noted in Appendix D for the trucks, dump cycles, and concrete batch plant operations.

The ambient noise level data for each of the sites listed in Table II were carefully reviewed to select conservative bases for comparison to the relatively steady-state noise levels produced by the proposed quarry operation (as perceived at a distance). For Ambient Measurement Sites 1 through 6, which were long-term measurement sites, the “ambient noise level” was represented by the measured hourly average noise levels (L_{eq}) at the quietest part of the day. The assumed ambient noise level was the energy (logarithmic) average of the hourly average noise levels of the quietest contiguous 4-hour period of the quietest day. For Ambient Measurement Sites 7, 8, and 9, which were short-term sites, the “ambient noise level” was represented by the lowest measured median noise levels (L_{50}) at the quietest part of the day. The L_{50} was used in place of

the L_{eq} in these cases to eliminate the effects of non-typical noise events during the measurement periods, such as aircraft and local traffic.

Tables VIII through XI list the predicted average project-related workday noise levels for each of the four project cases at each of the selected noise receptor monitoring locations. That is, the values portray the average noise levels when all of the fixed and mobile equipment is in use. These tables also provide a comparison to the measured ambient noise levels described by Table VII. Note that the last two entries in each table (Receptor Locations 36 and 37) represent points immediately north and west of the project site near the SMER boundary (see Figure 2.) These receiver locations are not among those listed on the master receptor list, but are included here to accommodate the MSHCP noise standard. Because Receptor Location 36 overlooks the project site, it potentially receives a worst-case noise exposure. Because these sites are located at the SMER property boundary, they also describe the worst-case sound levels that would be experienced by wildlife in the MSHCP Conservation Area. Given the surrounding topography, these sites are reasonably representative of the noise exposure expected along the entire boundaries between the project site and the SMER property.

Table XII shows the predicted workday project-related average noise levels, by project phase, at each sensitive receiver site, and the noise sources that produce those levels. Only the noise sources that produced sound levels within 10 dB of the total noise level are listed.

**TABLE VIII
COMPARISON OF PREDICTED AND AMBIENT LEQ VALUES
INITIAL CASE
Liberty Quarry Project**

Receiver	Description	Jurisdiction	Ambient Leq, dB	Project Leq, dB	Ambient + Project, dB	Significance Standard Leq, dB ¹	Significant Ambient + Project?	Change, dB	Significant Change?
2	Rainbow Exit Weigh Station ³	San Diego	53	60.4	61.1	67.5 (day) 65 (night)	No	8.1	No ³
3	Rainbow Residence	Riverside	39	40.0	42.5	65 (day) 45 (night)	No	3.5	No
4	Rainbow Residence	Riverside	39	40.9	43.1	65 (day) 45 (night)	No	4.1	No
7	Temecula Residence	Riverside	40	16.3	40.0	65 (day) 45 (night)	No	0	No
10	Cellular Tower	Temecula	45	17.0	45.0	65 (day) 45 (night)	No	0	No
12	Fallbrook Residence	San Diego	39	40.0	42.5	50 (day) 45 (night)	No	3.5	No
14	SMER1	Riverside	39	31.1	39.7	65 (day) 45 (night)	No	0.6	No
15	SMER2	Riverside	40	33.1	40.8	65 (day) 45 (night)	No	0.8	No
16	SMER3	Riverside	45	21.4	45.0	65 (day) 45 (night)	No	0	No
17	47725 Rainbow Valley Road	Riverside	53	44.6	53.6	65 (day) 45 (night)	No ⁴	0.6	No
18	2658 Huffstatler	San Diego	51	44.5	51.9	51 ²	No ²	0.9	No
19	Kirkpatrick Property	Riverside	34	38.3	39.7	65 (day) 45 (night)	No	5.7	Yes ⁵
20	31320 Via Eduardo	Temecula	44	14.7	44.0	65 (day) 45 (night)	No	0	No
21	Rainbow Valley Road	Temecula	49	17.0	49.0	65 (day) 45 (night)	No ⁴	0	No
35	28816 Pujol	Temecula	54	10.6	54.0	65 (day) 45 (night)	No ⁴	0	No
36	SMER/North Project Boundary	Riverside	39	32.4	39.9	65 (day) 45 (night)	No	0	No
37	SMER/West Project Boundary	Riverside	39	56.8	56.9	65 (day) 45 (night)	Yes (night only)	17.9	No ³

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.

² – Where the ambient L_{eq} for San Diego residential receptors exceeds 50 (day) or 45 (night) dB, the allowable one hour average sound level is the ambient noise level. The project will cause no perceptible increase in ambient noise levels at this location.

³ – Not a Noise Sensitive Land Use; the change significance standard does not apply.

⁴ – Ambient noise levels already exceed the nighttime L_{eq} threshold; the Liberty Quarry project will cause no perceptible increase in ambient noise levels at this Receptor Location.

⁵ – The change significance standard will not apply if Receptor Location 19 is not deemed to be a Noise Sensitive Land Use.

TABLE IX
COMPARISON OF PREDICTED AND AMBIENT LEQ VALUES
PHASE I
Liberty Quarry Project

Receiver	Description	Jurisdiction	Ambient L _{eq} , dB	Project L _{eq} , dB	Ambient + Project, dB	Significance Standard L _{eq} , dB ¹	Significant Ambient + Project?	Change, L _{eq} , dB	Significant Change?
2	Rainbow Exit Weigh Station ⁵	San Diego	53	60.7	61.4	67.5 (day) 65 (night)	No	8.4	No ³
3	Rainbow Residence	Riverside	39	37.2	41.2	65 (day) 45 (night)	No	2.2	No
4	Rainbow Residence	Riverside	39	34.7	40.4	65 (day) 45 (night)	No	1.4	No
7	Temecula Residence	Riverside	40	17.9	40.0	65 (day) 45 (night)	No	0	No
10	Cellular Tower	Temecula	45	19.8	45.0	65 (day) 45 (night)	No	0	No
12	Fallbrook Residence	San Diego	39	31.2	39.7	50 (day) 45 (night)	No	0.7	No
14	SMER1	Riverside	39	28.0	39.3	65 (day) 45 (night)	No	0.3	No
15	SMER2	Riverside	40	28.2	40.3	65 (day) 45 (night)	No	0.3	No
16	SMER3	Riverside	45	24.9	45.0	65 (day) 45 (night)	No	0	No
17	47725 Rainbow Valley Road	Riverside	53	44.5	53.6	65 (day) 45 (night)	No ⁴	0.6	No
18	2658 Huffstatler	San Diego	51	44.5	51.9	51 ²	No ²	0.9	No
19	Adjacent Private Property	Riverside	34	47.1	47.3	65 (day) 45 (night)	Yes (night only)	13.3	Yes ⁵
20	31320 Via Eduardo	Temecula	44	15.9	44.0	65 (day) 45 (night)	No	0	No
21	Rainbow Valley Road	Temecula	49	19.2	49.0	65 (day) 45 (night)	No ⁴	0	No
35	28816 Pujol	Temecula	54	11.2	54.0	65 (day) 45 (night)	No ⁴	0	No
36	SMER/North Project Boundary	Riverside	39	46.8	47.5	65 (day) 45 (night)	Yes (night only)	8.5	No ³
37	SMER/West Project Boundary	Riverside	39	49.6	50.0	65 (day) 45 (night)	Yes (night only)	11.0	No ³

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.

² – Where the ambient L_{eq} for San Diego residential receptors exceeds 50 (day) or 45 (night) dB, the allowable one hour average sound level is the ambient noise level. The project will cause no perceptible increase in ambient noise levels at this location.

³ – Not a Noise Sensitive Land Use; the change significance standard does not apply.

⁴ – Ambient noise levels already exceed the nighttime L_{eq} threshold; the Liberty Quarry project will cause no perceptible increase in ambient noise levels at this Receptor Location.

⁵ – The change significance standard will not apply if Receptor Location 19 is not deemed to be a Noise Sensitive Land Use.

**TABLE X
COMPARISON OF PREDICTED AND AMBIENT LEQ VALUES
PHASE 2
Liberty Quarry Project**

Receiver	Description	Jurisdiction	Ambient L _{eq} , dB	Project L _{eq} , dB	Ambient + Project, dB	Significance Standard L _{eq} , dB ¹	Significant Ambient + Project?	Change, L _{eq} , dB	Significant Change?
2	Rainbow Exit Weigh Station ⁵	San Diego	53	60.4	61.1	67.5 (day) 65 (night)	No	8.1	No ³
3	Rainbow Residence	Riverside	39	37.2	41.2	65 (day) 45 (night)	No	2.2	No
4	Rainbow Residence	Riverside	39	34.9	40.4	65 (day) 45 (night)	No	1.4	No
7	Temecula Residence	Riverside	40	17.7	40.0	65 (day) 45 (night)	No	0	No
10	Cellular Tower	Temecula	45	19.1	45.0	65 (day) 45 (night)	No	0	No
12	Fallbrook Residence	San Diego	39	31.2	39.7	50 (day) 45 (night)	No	0.7	No
14	SMER1	Riverside	39	28.1	39.3	65 (day) 45 (night)	No	0.3	No
15	SMER2	Riverside	40	28.0	40.3	65 (day) 45 (night)	No	0.3	No
16	SMER3	Riverside	45	23.9	45.0	65 (day) 45 (night)	No	0	No
17	47725 Rainbow Valley Road	Riverside	53	44.5	53.6	65 (day) 45 (night)	No ⁴	0.6	No
18	2658 Huffstatler	San Diego	51	44.5	51.9	51 ²	No ²	0.9	No
19	Kirkpatrick Property	Riverside	34	47.2	47.4	65 (day) 45 (night)	Yes (night only)	13.4	Yes ⁵
20	31320 Via Eduardo	Temecula	44	15.9	44.0	65 (day) 45 (night)	No	0	No
21	Rainbow Valley Road	Temecula	49	19.2	49.0	65 (day) 45 (night)	No ⁴	0	No
35	28816 Pujol	Temecula	54	11.3	54.0	65 (day) 45 (night)	No ⁴	0	No
36	SMER/North Project Boundary	Riverside	39	42.6	44.2	65 (day) 45 (night)	No	5.2	No ³
37	SMER/West Project Boundary	Riverside	39	49.5	49.9	65 (day) 45 (night)	Yes (night only)	10.9	No ³

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.

² – Where the ambient L_{eq} for San Diego residential receptors exceeds 50 (day) or 45 (night) dB, the allowable one hour average sound level is the ambient noise level. The project will cause no perceptible increase in ambient noise levels at this location.

³ – Not a Noise Sensitive Land Use; the change significance standard does not apply.

⁴ – Ambient noise levels already exceed the nighttime L_{eq} threshold; the Liberty Quarry project will cause no perceptible increase in ambient noise levels at this Receptor Location.

⁵ – The change significance standard will not apply if Receptor Location 19 is not deemed to be a Noise Sensitive Land Use.

TABLE XI
COMPARISON OF PREDICTED AND AMBIENT LEQ VALUES
PHASE 3
Liberty Quarry Project

Receiver	Description	Jurisdiction	Ambient L _{eq} , dB	Project L _{eq} , dB	Ambient + Project, dB	Significance Standard L _{eq} , dB ¹	Significant Ambient + Project?	Change, L _{eq} , dB	Significant Change?
2	Rainbow Exit Weigh Station ⁵	San Diego	53	60.4	61.1	67.5 (day) 65 (night)	No	8.1	No ³
3	Rainbow Residence	Riverside	39	31.8	39.8	65 (day) 45 (night)	No	0.8	No
4	Rainbow Residence	Riverside	39	32.3	39.8	65 (day) 45 (night)	No	0.8	No
7	Temecula Residence	Riverside	40	16.1	40.0	65 (day) 45 (night)	No	0	No
10	Cellular Tower	Temecula	45	16.9	45.0	65 (day) 45 (night)	No	0	No
12	Fallbrook Residence	San Diego	39	25.2	39.2	50 (day) 45 (night)	No	0.2	No
14	SMER1	Riverside	39	26.1	39.2	65 (day) 45 (night)	No	0.2	No
15	SMER2	Riverside	40	21.3	40.1	65 (day) 45 (night)	No	0.1	No
16	SMER3	Riverside	45	20.7	45.0	65 (day) 45 (night)	No	0	No
17	47725 Rainbow Valley Road	Riverside	53	44.6	53.6	65 (day) 45 (night)	No ⁴	0.6	No
18	2658 Huffstatler	San Diego	51	43.6	51.7	51 ²	No ²	0.7	No
19	Kirkpatrick Property	Riverside	34	42.5	43.1	65 (day) 45 (night)	No	9.1	Yes ⁵
20	31320 Via Eduardo	Temecula	44	14.8	44.0	65 (day) 45 (night)	No	0	No
21	Rainbow Valley Road	Temecula	49	16.8	49.0	65 (day) 45 (night)	No ⁴	0	No
35	28816 Pujol	Temecula	54	10.0	54.0	65 (day) 45 (night)	No ⁴	0	No
36	SMER/North Project Boundary	Riverside	39	36.7	41.0	65 (day) 45 (night)	No	2.0	No ³
37	SMER/West Project Boundary	Riverside	39	44.7	45.7	65 (day) 45 (night)	Yes (night only)	6.7	No ³

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.

² – Where the ambient L_{eq} for San Diego residential receptors exceeds 50 (day) or 45 (night) dB, the allowable one hour average sound level is the ambient noise level. The project will cause no perceptible increase in ambient noise levels at this location.

³ – Not a Noise Sensitive Land Use; the change significance standard does not apply.

⁴ – Ambient noise levels already exceed the nighttime L_{eq} threshold; the Liberty Quarry project will cause no perceptible increase in ambient noise levels at this Receptor Location.

⁵ – The change significance standard will not apply if Receptor Location 19 is not deemed to be a Noise Sensitive Land Use.

**TABLE XII
PREDICTED LEQ VALUES AND DOMINANT NOISE SOURCES
Liberty Quarry Project**

Receiver	Description	Initial Case		Phase 1		Phase 2		Phase 3	
		Leq, dB	Sources	Leq, dB	Sources	Leq, dB	Sources	Leq, dB	Sources
2	Rainbow Exit Weigh Station	60.4	Trucks on access road	60.7	Trucks on access road	60.4	Trucks on access road	60.4	Trucks on access road
3	Rainbow Glen residence	40.0	Drill rig, power shovel, haul trucks	37.2	Haul trucks, asphalt plant, fill concrete trucks	37.2	Haul trucks, asphalt plant	31.8	Gensets, power shovel, drill rig, fill concrete trucks, asphalt plant
4	Rainbow Glen residence	40.9	Drill rig, power shovel, asphalt plant, loaders, bulldozers	34.7	Asphalt plant, haul trucks, fill concrete trucks	34.9	Asphalt plant, fill concrete trucks, haul trucks	32.3	Gensets, power shovel, drill rig, fill concrete trucks, asphalt plant
7	Temecula residence	16.3	Drill rig, power shovel, asphalt plant, loaders, bulldozers	17.9	Power shovel, drill rig, loaders, bulldozers	17.7	Power shovel, drill rig, loaders, bulldozers, asphalt plant	16.1	Power shovel, drill rig, asphalt plant, bulldozers, loaders
10	Cellular Tower	17.0	Drill rig, power shovel, asphalt plant, loaders, bulldozers	19.8	Power shovel, drill rig, loaders, bulldozers	19.1	Power shovel, drill rig, loaders, bulldozers, asphalt plant	16.9	Power shovel, drill rig, asphalt plant, bulldozers, loaders
12	Fallbrook residence	40.0	Drill rig, power shovel, asphalt plant, loaders, bulldozers	31.2	Asphalt plant, haul trucks	31.2	Asphalt plant, haul trucks, recycle plant, crushers	25.2	Gensets, screens, power shovel, drill rig

14	SMER1	31.1	Drill rig, power shovel, asphalt plant, loaders, bulldozers	28.0	Asphalt plant, trucks on access road, power shovel, drill rig	28.1	Asphalt plant, haul trucks, power shovel, drill rig	26.1	Power shovel, drill rig, gensets, asphalt plant, fill concrete trucks
15	SMER2	33.1	Drill rig, power shovel, asphalt plant, loaders, bulldozers	28.2	Asphalt plant, fill concrete trucks, recycle plant, gensets	28.0	Fill concrete trucks, asphalt plant, recycle plant	21.3	Gensets, asphalt plant, fill concrete trucks, power shovel
16	SMER3	21.4	Drill rig, power shovel, asphalt plant, loaders, bulldozers	24.9	Power shovel, drill rig, bulldozers, asphalt plant	23.9	Power shovel, drill rig, bulldozers, asphalt plant	20.7	Power shovel, drill rig, asphalt plant, loaders, bulldozers
17	47725 Rainbow Valley Road	44.6	Trucks on access road	44.5	Trucks on access road	44.5	Trucks on access road	44.6	Trucks on access road
18	2658 Huffstatler	44.5	Trucks on access road	44.5	Trucks on access road	44.5	Trucks on access road	43.6	Trucks on access road
19	Kirkpatrick property	38.3	Drill rig, power shovel, asphalt plant, loaders, bulldozers	47.1	Asphalt plant, recycle plant, loaders, fill concrete trucks, crushers	47.2	Fill concrete trucks, recycle plant, asphalt plant, crushers	42.5	Drill rig, power shovel, fill concrete trucks, gensets, screens
20	31320 Via Eduardo	14.7	Drill rig, power shovel, asphalt plant, loaders, bulldozers, haul trucks	15.9	Drill rig, power shovel, bulldozers, loaders, asphalt plant	15.9	Drill rig, power shovel, bulldozers, loaders	14.8	Drill rig, power shovel, asphalt plant
21	Rainbow Valley Rd - Temecula	17.0	Drill rig, power shovel, asphalt plant, loaders, bulldozers	19.2	Drill rig, power shovel, bulldozers, loaders	19.2	Drill rig, power shovel, bulldozers, loaders,	16.8	Drill rig, power shovel, asphalt plant

35	28816 Pujol	10.6	Drill rig, power shovel, asphalt plant, loaders, bulldozers	11.2	Drill rig, power shovel	11.3	Drill rig, power shovel, asphalt plant, loaders	10.0	Drill rig, power shovel, asphalt plant
36	Near north Project Boundary	32.4	Drill rig, power shovel, asphalt plant, loaders, bulldozers	46.8	Drill rig, power shovel, bulldozers, loaders,	42.6	Asphalt plant, loaders, fill concrete trucks, drill rig	36.7	Asphalt plant, drill rig, gensets, power shovel, fill concrete trucks
37	Near west Project Boundary	56.8	Drill rig, power shovel, loaders, bulldozers, crushers, screens	49.6	Crushers, screens, recycle plant, asphalt plant, fill concrete trucks	49.5	Crushers, screens, recycle plant, asphalt plant, fill concrete trucks	44.7	Screens, gensets, fill concrete truck, power shovel

The ENM was also used to prepare noise contours for the project in terms of the average noise level (L_{eq}). The 45 dB and 65 dB L_{eq} contours for all mining and plant operations are presented in Appendices G1 through G4.

Land Use Compatibility - Day-Night Levels Associated with the Quarry

For assessment of noise levels in terms of the Day-Night Level (L_{dn}), it was necessary to make certain assumptions about the hours of operation for the Liberty Quarry. For this analysis, it was assumed that the Liberty Quarry would be in operation from 4 a.m. to midnight on any given day¹⁰. Given these assumptions, the L_{dn} values would be 4.3 dB higher than the L_{eq} values shown by Tables VIII through XI. Similarly, 4.3 dB should be added to the L_{eq} noise contours, so that the 45 dB L_{eq} contour represents 49.3 dB L_{dn} , and the 65 dB L_{eq} contour represents 69.3 dB L_{dn} .

Ambient L_{dn} values were taken to be the quietest daily L_{dn} value observed during the continuous noise measurement periods. Where only short-term noise measurement data were available, the L_{dn} was estimated from the measured L_{eq} values in the day and night time periods.

Table XIII through XVI list the predicted L_{dn} values for the proposed Quarry operations in the Initial case and Phases 1, 2 and 3, and provide a comparison to the measured ambient L_{dn} values.

¹⁰ Per the Project Description, the quarry may conduct load-out and similar activities 24 hours per day in order to accommodate Caltrans or other public agency project needs. (See Project Description, Page 1.)

TABLE XIII
LAND USE COMPATIBILITY: Liberty Quarry Project
COMPARISON OF PREDICTED AND AMBIENT DAY-NIGHT LEVELS: INITIAL CASE

Receiver	Description	Jurisdiction	Ambient L _{dn} , dB	Project L _{dn} , dB	Ambient + Project L _{dn} , dB	Significance Standard dB L _{dn}	Exceeds L _{dn} Standard?	Change, dB L _{dn}	Significant Change?
2	Rainbow Exit Weigh Station ³	San Diego	65	64.7	67.9	Not Applicable ³	No	2.9	No ³
3	Rainbow Residence	Riverside	50	44.3	51.0	60/70 ¹	No	1.0	No
4	Rainbow Residence	Riverside	50	45.2	51.2	60/70 ¹	No	1.2	No
7	Temecula Residence	Riverside	52	20.6	52.0	60/70 ¹	No	0	No
10	Cellular Tower	Temecula	56	21.3	56.0	60/70 ¹	No	0	No
12	Fallbrook Residence	San Diego	50	44.3	51.0	60 or Increase of 10 dB over ambient	No	1.0	No
14	SMER1	Riverside	49.8	35.4	50.0	60/70 ¹	No	0.2	No
15	SMER2	Riverside	52.5	37.4	52.6	60/70 ¹	No	0.1	No
16	SMER3	Riverside	55	25.7	55.0	60/70 ¹	No	0	No
17	47725 Rainbow Valley Road	Riverside	64.6	48.9	64.7	60/70 ¹	No ²	0.1	No
18	2658 Huffstatler	San Diego	61.2	48.8	61.4	60 or Increase of 10 dB over ambient	No ⁴	0.2	No
19	Kirkpatrick Property	Riverside	51.3	42.6	51.8	60/70 ¹	No	0.5	No
20	31320 Via Eduardo	Temecula	52	19.0	52.0	60/70 ¹	No	0	No
21	Rainbow Valley Road	Temecula	62	21.3	62.0	60/70 ¹	No ²	0	No
35	28816 Pujol	Temecula	61	14.9	61.0	60/70 ¹	No ²	0	No
36	SMER/North Project Boundary	Riverside	49.8	36.7	49.8	60/70 ¹	No	0	No
37	SMER/West Project Boundary	Riverside	49.8	61.1	61.4	60/70 ¹	No	11.6	No ³

¹ – Conditionally acceptable to 70 dB; requires noise analysis and noise attenuation measures.

² – Ambient noise levels already exceed the “Normally Acceptable” limit; project plus ambient noise levels are within the “Conditionally Acceptable” limit; project-induced increases are well below 1.0 dB, and thus below the threshold of human perception. Noise attenuation is not required.

³ – Not a Noise Sensitive Land Use; the 60 dB L_{dn} or increase of 10 dB over ambient standard does not apply.

⁴ – Ambient noise levels already exceed 60 dB L_{dn}; the project results in a less than perceptible (1 dB) increase over pre-existing noise levels.

TABLE XIV
LAND USE COMPATIBILITY: Liberty Quarry Project
COMPARISON OF PREDICTED AND AMBIENT DAY-NIGHT LEVELS: PHASE I

Receiver	Description	Jurisdiction	Ambient L _{dn} , dB	Project L _{dn} , dB	Ambient + Project L _{dn} , dB	Significance Standard dB L _{dn}	Exceeds L _{dn} Standard?	Change, dB L _{dn}	Significant Change?
2	Rainbow Exit Weigh Station ³	San Diego	64	65.0	67.5	Not Applicable ³	No ³	3.5	No ³
3	Rainbow Residence	Riverside	50	41.5	50.6	60/70 ¹	No	0.6	No
4	Rainbow Residence	Riverside	50	39.0	50.3	60/70 ¹	No	0.3	No
7	Temecula Residence	Riverside	52	22.2	52.0	60/70 ¹	No	0	No
10	Cellular Tower	Temecula	56	24.1	56.0	60/70 ¹	No	0	No
12	Fallbrook Residence	San Diego	50	35.5	50.2	60 or Increase of 10 dB over ambient	No	0.2	No
14	SMER1	Riverside	49.8	32.3	49.9	60/70 ¹	No	0.1	No
15	SMER2	Riverside	52.5	32.5	52.5	60/70 ¹	No	0	No
16	SMER3	Riverside	55	29.2	55.0	60/70 ¹	No	0	No
17	47725 Rainbow Valley Road	Riverside	64.6	48.8	64.7	60/70 ¹	No ²	0.1	No
18	2658 Huffstatler	San Diego	61.2	48.8	61.4	60 or Increase of 10 dB over ambient	No ⁴	0.2	No
19	Kirkpatrick Property	Riverside	51.3	51.4	54.4	60/70 ¹	No	3.1	No
20	31320 Via Eduardo	Temecula	52	20.2	52.0	60/70 ¹	No	0	No
21	Rainbow Valley Road	Temecula	62	23.5	62.0	60/70 ¹	No ²	0	No
35	28816 Pujol	Temecula	61	15.5	61.0	60/70 ¹	No ²	0	No
36	SMER/North Project Boundary	Riverside	49.8	51.1	53.5	60/70 ¹	No	4.7	No
37	SMER/West Project Boundary	Riverside	49.8	53.9	55.3	60/70 ¹	No	5.5	No

¹ – Conditionally acceptable to 70 dB; requires noise analysis and noise attenuation measures.

² – Ambient noise levels already exceed the “Normally Acceptable” limit; project plus ambient noise levels are within the “Conditionally Acceptable” limit; project-induced increases are well below 1.0 dB, and thus below the threshold of human perception. Noise attenuation is not required.

³ – Not a Noise Sensitive Land Use; the 60 dB L_{dn} or increase of 10 dB over ambient standard does not apply.

⁴ – Ambient noise levels already exceed 60 dB L_{dn}; the project results in a less than perceptible (1 dB) increase over pre-existing noise levels.

**TABLE XV
LAND USE COMPATIBILITY: Liberty Quarry Project
COMPARISON OF PREDICTED AND AMBIENT DAY-NIGHT LEVELS: PHASE 2**

Receiver	Description	Jurisdiction	Ambient L _{dn} , dB	Project L _{dn} , dB	Ambient + Project L _{dn} , dB	Significance Standard dB L _{dn}	Exceeds L _{dn} Standard?	Change, dB L _{dn}	Significant Change?
2	Rainbow Exit Weigh Station ³	San Diego	64	64.7	67.4	Not Applicable ³	No ³	3.4	No ³
3	Rainbow Residence	Riverside	50	41.5	50.6	60/70 ¹	No	0.6	No
4	Rainbow Residence	Riverside	50	39.2	50.3	60/70 ¹	No	0.3	No
7	Temecula Residence	Riverside	52	22.0	52.0	60/70 ¹	No	0	No
10	Cellular Tower	Temecula	56	23.4	56.0	60/70 ¹	No	0	No
12	Fallbrook Residence	San Diego	50	35.5	50.2	60 or Increase of 10 dB over ambient	No	0.2	No
14	SMER1	Riverside	49.8	32.4	49.9	60/70 ¹	No	0.1	No
15	SMER2	Riverside	52.5	32.3	52.5	60/70 ¹	No	0	No
16	SMER3	Riverside	55	28.2	55.0	60/70 ¹	No	0	No
17	47725 Rainbow Valley Road	Riverside	64.6	48.8	64.7	60/70 ¹	No ²	0.1	No
18	2658 Huffstatler	San Diego	61.2	48.8	61.4	60 or Increase of 10 dB over ambient	No ⁴	0.2	No
19	Kirkpatrick Property	Riverside	51.3	51.5	54.4	60/70 ¹	No	3.1	No
20	31320 Via Eduardo	Temecula	52	20.2	52.0	60/70 ¹	No	0	No
21	Rainbow Valley Road	Temecula	62	23.5	62.0	60/70 ¹	No ²	0	No
35	28816 Pujol	Temecula	61	15.6	61.0	60/70 ¹	No ²	0	No
36	SMER/North Project Boundary	Riverside	49.8	46.9	51.6	60/70 ¹	No	1.8	No
37	SMER/West Project Boundary	Riverside	49.8	53.8	55.3	60/70 ¹	No	5.5	No

¹ – Conditionally acceptable to 70 dB; requires noise analysis and noise attenuation measures.

² – Ambient noise levels already exceed the “Normally Acceptable” limit; project plus ambient noise levels are within the “Conditionally Acceptable” limit; project-induced increases are well below 1.0 dB, and thus below the threshold of human perception. Noise attenuation is not required.

³ – Not a Noise Sensitive Land Use; the 60 dB L_{dn} or increase of 10 dB over ambient standard does not apply.

⁴ – Ambient noise levels already exceed 60 dB L_{dn}; the project results in a less than perceptible (1 dB) increase over pre-existing noise levels.

TABLE XVI
LAND USE COMPATIBILITY: Liberty Quarry Project
COMPARISON OF PREDICTED AND AMBIENT DAY-NIGHT LEVELS: PHASE 3

Receiver	Description	Jurisdiction	Ambient L _{dn} , dB	Project L _{dn} , dB	Ambient + Project L _{dn} , dB	Significance Standard dB L _{dn}	Exceeds L _{dn} Standard?	Change, dB L _{dn}	Significant Change?
2	Rainbow Exit Weigh Station ³	San Diego	64	64.7	67.4	Not Applicable ³	No	3.4	No ³
3	Rainbow Residence	Riverside	50	36.1	50.2	60/70 ¹	No	0.2	No
4	Rainbow Residence	Riverside	50	36.6	50.2	60/70 ¹	No	0.2	No
7	Temecula Residence	Riverside	52	20.4	52.0	60/70 ¹	No	0	No
10	Cellular Tower	Temecula	56	21.2	56.0	60/70 ¹	No	0	No
12	Fallbrook Residence	San Diego	50	29.5	50.0	60 or Increase of 10 dB over ambient	No	0	No
14	SMER1	Riverside	49.8	30.4	49.8	60/70 ¹	No	0	No
15	SMER2	Riverside	52.5	25.6	52.5	60/70 ¹	No	0	No
16	SMER3	Riverside	55	25.0	55.0	60/70 ¹	No	0	No
17	47725 Rainbow Valley Road	Riverside	64.6	48.9	64.7	60/70 ¹	No ²	0.1	No
18	2658 Huffstatler	San Diego	61.2	47.9	61.4	60 or Increase of 10 dB over ambient	No ⁴	0.2	No
19	Kirkpatrick Property	Riverside	51.3	46.8	52.6	60/70 ¹	No	1.3	No
20	31320 Via Eduardo	Temecula	52	19.1	52.0	60/70 ¹	No	0	No
21	Rainbow Valley Road	Temecula	62	21.1	62.0	60/70 ¹	No ²	0	No
35	28816 Pujol	Temecula	61	14.3	61.0	60/70 ¹	No ²	0	No
36	SMER/North Project Boundary	Riverside	49.8	41.0	50.3	60/70 ¹	No	0.5	No
37	SMER/West Project Boundary	Riverside	49.8	49.0	52.4	60/70 ¹	No	2.6	No

¹ – Conditionally acceptable to 70 dB; requires noise analysis and noise attenuation measures.

² – Ambient noise levels already exceed the “Normally Acceptable” limit; project plus ambient noise levels are within the “Conditionally Acceptable” limit; project-induced increases are well below 1.0 dB, and thus below the threshold of human perception. Noise attenuation is not required.

³ – Not a Noise Sensitive Land Use; the 60 dB L_{dn} or increase of 10 dB over ambient standard does not apply.

⁴ – Ambient noise levels already exceed 60 dB L_{dn}; the project results in a less than perceptible (1 dB) increase over pre-existing noise levels.

Traffic Noise

As noted in the Setting section of this document, the dominant existing noise source in the project area is traffic on I-15. In general, traffic noise levels are highest in working hours after 5 a.m., and lowest from midnight to 4 a.m. The highest traffic noise level occurs between 5 and 6 a.m., due to relatively high hourly traffic volumes and free-flowing traffic. Noise levels at a reference distance along the course of the highway will vary due to differences in the topography of the adjacent lands, and the height of the roadway relative to the receivers.

Noise levels due to traffic on I-15 were predicted using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model is an analytical method that has long been favored for traffic noise prediction by state and local agencies, and has been applied to numerous federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO (California/Nevada) noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the day/night distribution of traffic and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

It was assumed that a representative noise exposure for noise sensitive receivers would occur at a reference distance of 150 feet from the centerline of the roadway. The Annual Average Daily Traffic (AADT) volume for existing conditions (year 2005) was 136,000 vehicles, and truck mix was assumed to be 2.5% medium trucks and 4.25% heavy trucks, based upon Caltrans traffic counts near the project site in 2005. Day-night distribution of traffic noise was assumed to be 62%/38% for existing conditions, based on the ambient noise measurement results at 47725 Rainbow Valley Road. Average vehicle speed was assumed to be 65 mph.

The project would include up to 800 truck trips per day, or up to 96 truck trips per hour, which would enter the site from I-15. Assuming that 800 truck trips would occur per day, the change in traffic noise levels may be calculated using the FHWA model. If these trips began in 2005, the resulting ADT would be 136,800, and the heavy truck mix would increase from 4.25% to 5.1%.

Table XVII lists the traffic noise modeling results for the year 2005 with and without the project in terms of the Day-Night level (L_{dn}).

TABLE XVII PREDICTED I-15 TRAFFIC NOISE LEVELS Year 2005							
Predicted L _{dn} , dB, at 150 feet from I-15 Centerline				Distances from I-15 Centerline to L _{dn} Contours, feet			
Autos	Medium Trucks	Heavy Trucks	Total	75 dB	70 dB	65 dB	60 dB
Without Project							
77.3	67.8	73.6	79.2	286	616	1,326	2,857
With Project							
77.3	67.8	74.6	79.5	300	646	1,392	2,999

Based upon Table XVII, the project-related truck traffic would cause the predicted L_{dn} to increase by up to 0.3 dB. This increase would be experienced at all receiver locations affected by I-15 traffic noise.

The measured I-15 traffic noise levels at 47725 Rainbow Valley Road (Ambient Measurement Site 4 [Receptor Location 17]) were in the range of 65 dB L_{dn}. This site is representative of the closest residential receivers along I-15 in the project vicinity. The predicted change in the traffic noise level of 0.3 dB is below the applicable standard of significance (an increase of 1.5 dB or more for areas where the ambient noise level without project exceeds 65 dB L_{dn}) shown in Table V above. Therefore, the project will not cause a significant increase in traffic-related noise levels.

Construction Noise

Construction of the quarry site would require use of a variety of engine-powered equipment on the site and along the access road route. In addition, a settling pond would be constructed at the southwest corner of the project site.

The project is located within one-quarter mile of an occupied residence or residences located within unincorporated Riverside County. Therefore, in accordance with the Riverside County Construction Noise Ordinance (Riverside County Code Section 15.04.020), construction would not be allowed between the hours of 6:00 p.m. and 6:00 a.m., absent written consent of the County building official. The Riverside County Code does not specify additional construction noise restrictions.

The project is not located within one-quarter mile of any occupied residences within the City of Temecula, therefore the City's Construction Noise Ordinance (City of Temecula Municipal Code Section 8.32.020) does not apply.

The San Diego County Code, Section 36.410, prohibits construction activities between 7 p.m. and 7 a.m., and limits construction-related sound levels to 75 dB L_{eq} (one-hour) at the property line of any legal dwelling.

The noise levels associated with typical construction equipment are shown by Table XVIII. During the construction phase of the project, noise from construction equipment would dominate the noise environment in the immediate area. The nearest potentially affected sensitive receivers

would be the homes in Rainbow Valley east of the project site, located within unincorporated San Diego and Riverside Counties. These homes would be potentially exposed to noise from construction of the access road. Homes in Rainbow Valley southwest of the project site, also located within unincorporated San Diego and Riverside Counties, would be exposed to heavy equipment and blasting noise during construction of the settling pond. These tasks are expected to occur over a period of about 13 months.

Maximum noise levels from different types of equipment under different operating conditions could range from 70 dB to 90 dB at a distance of 50 feet. The actual noise effects at any given sensitive receiver location near the project site would be the result of a series of construction tasks. For example, bulldozers would rough out the roadway, followed by blasting as needed. Bulldozers and loaders would move the loose materials to haul trucks, which would either leave the site or transfer materials to areas needing fill. Scrapers and graders would level the road, and paving machines would follow. Other equipment would deliver and install materials and utilities. Compressors and generators could be used at any time.

The maximum noise levels received at the property lines of the nearest legal residences, which are in the range of 1,000 feet away from the access road, would be reduced by about 26 dB as compared to the values shown by Table XVIII. Therefore, maximum construction noise levels at the nearest houses would be in the range of about 45 to 65 dB, L_{max} . Given that the maximum noise level is not expected to exceed 65 dB, the average noise level is not expected to exceed this amount as well. This value is well below the San Diego County construction noise level standard of 75 dB L_{eq} (one-hour).

Noise produced during construction of the access road would be masked to a certain extent by the noise of traffic on I-15. Median ambient noise levels at the houses immediately adjacent to I-15 were measured in the range of 54 to 63 dB. Depending upon the time of day and the location of the receiver, roadway construction noise levels below about 44 dB could be masked by traffic noise, and noise levels up to about 63 dB could be perceptible, though probably not intrusive.

**TABLE XVIII
REFERENCE NOISE EMISSION LEVELS AND USAGE FACTORS FOR CONSTRUCTION
EQUIPMENT**

Equipment Description	Impact Device ?	Typical Use Factor %	Predicted Lmax @ 50 ft (dBA, slow)	Average Measured Lmax @ 50 ft (dBA, slow)	No. of Data Samples
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Boring Jack Power Unit	No	50	80	83	1
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader 19	No	40	85	-- N/A --	0
Horizontal Boring Hydr. Jack	No	25	80	82	6
Jackhammer	Yes	20	85	89	133
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarifier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Tractor	No	40	84	-- N/A --	0
Ventilation Fan	No	100	85	79	13
Warning Horn	No	5	85	83	12
Welder / Torch	No	40	73	74	5

Source: FHWA Roadway Construction Noise Model, February 15, 2006.

Construction of the settling pond at the southwest portion of the project site would involve the use of heavy equipment including bulldozers, truck, loaders, and scrapers. The nearest home to the settling pond would be Receptor 3 in Rainbow Valley, located in San Diego County. The property line for this receptor is located about 1,900 feet from the nearest edge of the pond. Assuming that up to six pieces of heavy equipment would be operating continuously near the edge of the pond, and that all were clearly visible from the nearest house, the predicted worst-case maximum and average noise levels at the Receptor 3 property line would be about 62 dB.

The L_{eq} would therefore be 62 dB or less, well below the San Diego County maximum construction noise level standard of 75 dB L_{eq} (one-hour).

In practice, considering the topography of the project area, it is likely that few pieces of equipment would be in a line of sight with the receptor in Rainbow Valley. The other equipment would be shielded by topography, and its noise levels would be reduced by 5 to 10 dB. In addition, the equipment would be placed in close proximity to the southwest project boundary during only a portion of the construction phase. During the remainder of the construction period, the equipment would be distributed across the pond site, and noise levels would be correspondingly reduced.

Therefore, project-related construction will not cause significant noise impacts during any phase.

Blasting Noise

Blasting would be conducted to break up the rock for hauling and processing. Mining activity is usually stopped for a period of about 10 minutes before and after the blasting. In general, blasting is controlled to minimize dispersal of the rock fragments, and to ensure the safety of the workers. Blasting is also controlled to prevent damage to nearby structures, including any on-site construction trailers.

Airborne overpressures produced by blasting are typically measured in terms of the overall peak sound pressure level, without applying the A-weighting filter. The dominant frequencies of sound pressures associated with blasting lie in the low frequency range of 2 Hz to 25 Hz, and the acoustical energy is concentrated below about 5 Hz. Figure 3 depicts a typical blast acoustical spectrum, which shows that the acoustical energy is concentrated well below 5 Hz.

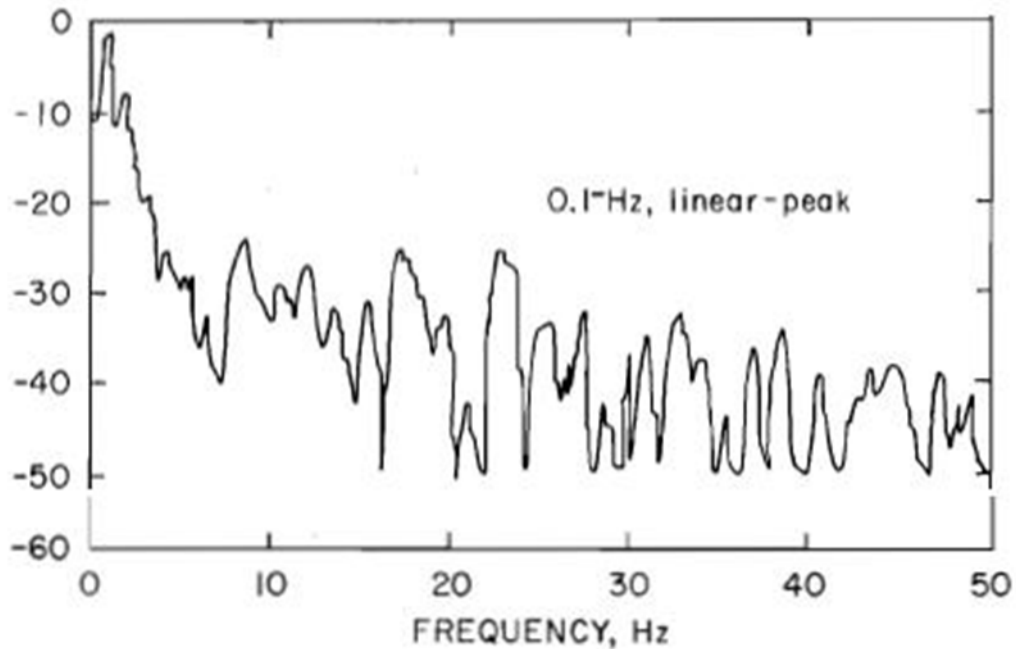
The significance criteria for blasting indicate that the threshold for annoyance due to blast-induced air overpressure is a peak value of 0.01 pounds per square inch (psi).¹¹ Assuming that the project is designed so that a worst-case blast would not exceed 0.01 psi¹², and that all the energy of a blast would be concentrated at 25 Hz, the highest possible *peak* airborne A-weighted sound pressure level due to a blast would be 65 dB, and the *maximum* noise level would likely be in the range of 55 to 60 dB. (The *maximum* sound pressure level is lower than the *peak* level because *peak* and *maximum* levels are measured differently, as described by Appendix A.) If a single blast that produced a maximum noise level of 60 dB with a two-second duration were to occur in a ten-minute period, the resulting ten-minute L_{eq} would be 35.2 dB. This would be well within the applicable residential noise standards.

¹¹ Vibra-Tech Engineers (2007).

¹² The blasting analysis performed for the Liberty Quarry project (Vibra-Tech Engineers, 2007) indicates that no sensitive receptors would be exposed to overpressures exceeding 0.01 psi. The highest expected overpressure exposure would occur at Receptor Location 19, during Phase I, and would be only 0.00799 psi. This equates to a peak airborne A-weighted sound pressure level of approximately 64 dB, and the resulting ten-minute L_{eq} would be 34.2 dB, well below the applicable standard for project-related noise.

Figure 3
Typical Blast Acoustical Spectrum

Relative Amplitude, dB

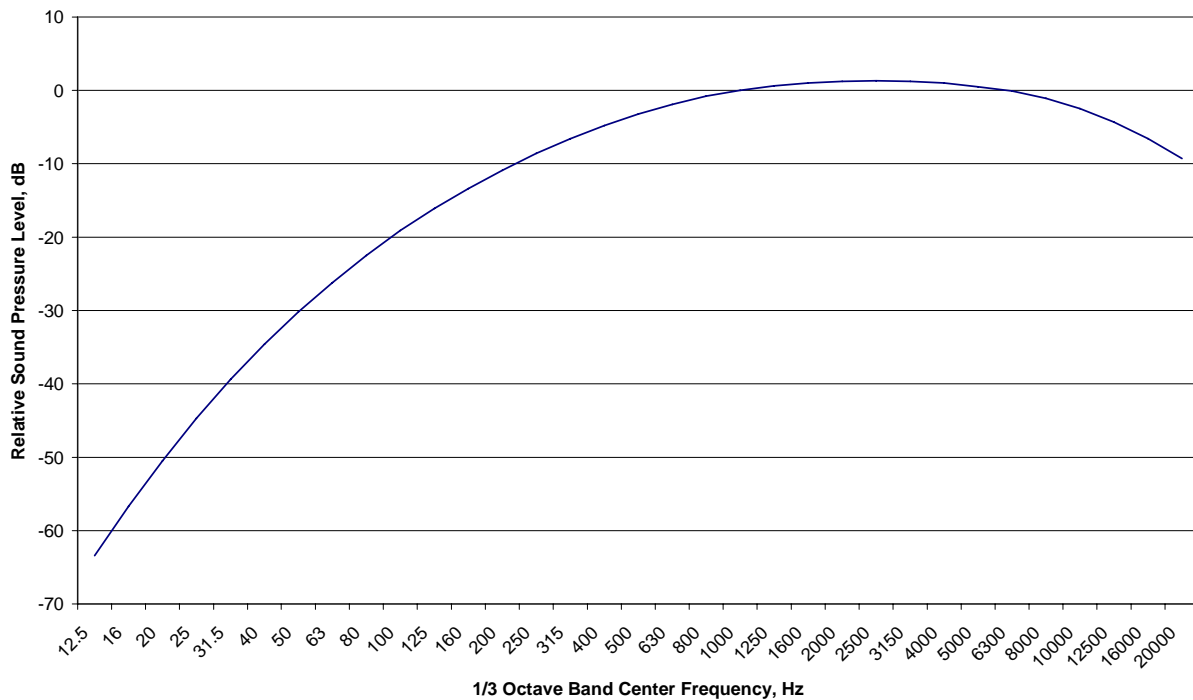


Source: "Airblast Instrumentation and Measurement Techniques for Surface Mine Blasting"
U.S. Dept. of the Interior Report of Investigations 8508.

Audible sound, in contrast, is usually assumed to begin at 20 Hz, ranging up to 20,000 Hz. People hear best at frequencies in the range of 1,000 Hz to 4,000 Hz, and people hear poorly at the low frequencies associated with blast overpressures. As a result, the A-weighting curve is usually applied to other environmental noise measurements. The A-weighting curve is shown by Figure 4 below.

The A-weighting adjustment factor for sound at 25 Hz is -44.7 dB. There are no published A-weighting correction factors below 12.5 Hz (where the A-weighting correction factor is -63.4 dB).

Figure 4
A-Weighting Filter Response



Source: BBA 2007; American National Standards Institute (ANSI) 1971.

Because of their frequency content and brief duration, blasting noise levels are difficult to predict in terms of A-weighted sound pressure levels. No noise propagation models are known to exist to predict the audible noise due to blasting; the ENM does not predict sound propagation for frequencies below 25 Hz.

The audible sound associated with blasting is reported to be the result of escaping gases and falling (slumping) rock. Subjectively, audible blasting sound has been described as similar to the closing of a car trunk. While these terms are subjective rather than quantitative, the described sounds are relatively benign.

Audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site.

SUMMARY OF IMPACTS

Summary of Impacts by Criterion:

This section lists the project-related noise impacts by criterion, before and after mitigation. Table XIX lists the project-related impacts to average noise (L_{eq}) levels before mitigation; Table XX lists the project-related impacts to average noise (L_{eq}) levels after mitigation. In effect, these values represent the noise levels expected for nighttime operations, after all of the mitigation measures are implemented

L_{eq} Standards

TABLE XIX SUMMARY OF PROJECT-RELATED NOISE IMPACTS AVERAGE NOISE LEVEL (L_{eq})¹ SIGNIFICANT IMPACTS WITHOUT MITIGATION					
Receiver / Phase	Description	Jurisdiction	Leq Standard, dB	Project + Ambient Leq, dB	Change, dB ²
19 / Initial Case	Kirkpatrick Property	Riverside	65 (day) 45 (night)	39.7 ³	5.7 (exceeds change standard)
19 / Phase 1	Kirkpatrick Property	Riverside	65 (day) 45 (night)	47.3 (exceeds night standard)	13.3 (exceeds change standard)
19 / Phase 2	Kirkpatrick Property	Riverside	65 (day) 45 (night)	47.4 (exceeds night standard)	13.4 (exceeds change standard)
19 / Phase 3	Kirkpatrick Property	Riverside	65 (day) 45 (night)	43.1 ³	9.1 (exceeds change standard)
36 / Phase 1	SMER/North Project Boundary	Riverside	65 (day) 45 (night)	47.5 (exceeds night standard)	8.5 ⁴
37 / Initial Case	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	56.9 (exceeds night standard)	17.9 ⁴
37 / Phase 1	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	50.0 (exceeds night standard)	11.0 ⁴
37 / Phase 2	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	49.9 (exceeds night standard)	10.9 ⁴
37 / Phase 3	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	45.7 (exceeds night standard)	6.7 ⁴

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.
² – Standards of significance at noise sensitive land uses are shown by Table IV.
³ – Does not exceed the applicable standard of significance.
⁴ – Not a Noise Sensitive Land Use.

TABLE XX
SUMMARY OF PROJECT-RELATED NOISE SIGNIFICANT IMPACTS
AVERAGE NOISE LEVEL (L_{eq})¹

SIGNIFICANCE LEVELS WITH MITIGATION

Receiver / Phase	Description	Jurisdiction	Leq Standard, dB	Mitigation Measure(s)	Project + Ambient Leq, dB	Change, dB ²
19 / Initial Case	Kirkpatrick Property	Riverside	65 (day) 45 (night)	1A, 1B, 1C	37.3 (not significant)	3.3 (not significant)
19 / Phase 1	Kirkpatrick Property	Riverside	65 (day) 45 (night)	1A, 1B, 1C	41.5 (not significant)	7.5 (significant)
19 / Phase 2	Kirkpatrick Property	Riverside	65 (day) 45 (night)	1A, 1B, 1C	41.6 (not significant)	7.6 (significant)
19 / Phase 3	Kirkpatrick Property	Riverside	65 (day) 45 (night)	1A, 1B, 1C	37.5 (not significant)	3.5 (not significant)
36 / Phase 1	SMER/North Project Boundary	Riverside	65 (day) 45 (night)	2A, 2B, 2C, 2D	40.7 (not significant)	1.7 ³ (not significant)
37 / Initial Case	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	3A, 3B, 3C	43.9 (not significant)	4.9 ³ (not significant)
37 / Phase 1	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	3A, 3B, 3C	43.9 (not significant)	4.9 ³ (not significant)
37 / Phase 2	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	3A, 3B, 3C	43.9 (not significant)	4.9 ³ (not significant)
37 / Phase 3	SMER/West Project Boundary	Riverside	65 (day) 45 (night)	3A, 3B, 3C	40.9 (not significant)	1.9 ³ (not significant)

¹ – L_{eq} (10-minute) for Riverside County; L_{eq} (one-hour) for San Diego.

² – Standard of significance is a project-related increase of greater than 5 dB, L_{eq} at noise sensitive land uses.

³ - Not a Noise Sensitive Land Use.

Land Use Compatibility (L_{dn}) Standards

No significant impacts.

Traffic Noise

As described above, the project will result in an increase of 0.3 dB L_{dn} to the ambient traffic noise levels described in Tables II and III. The applicable standard of significance is 1.5 dB L_{dn} . Therefore, the project will not cause a significant increase in traffic-related noise levels. No mitigation is required.

Construction Noise

As described above, the project will not result in a significant impact due to construction-related noise, provided that construction activities are limited to the appropriate hours. No mitigation is required.

Blasting Noise

As described above, the project will not result in a significant impact due to blasting-related airborne noise. No mitigation is required.

DISCUSSION OF IMPACTS AND MITIGATION MEASURES

Impact 1: Project-Related Noise Would Exceed the Nighttime Noise Standard and Cause Significant Changes in L_{eq} Values at Receiver Site 19.

As shown in Table XIX, project-related noise levels at Receiver Site 19 would exceed the nighttime L_{eq} standard in Phases 1 and 2, and would cause a significant increase in ambient L_{eq} noise levels during all project phases.

It is important to note that these significance determinations assume that Receiver Site 19 is considered to be a noise sensitive land use by the County of Riverside. As described above, this Receiver is not a permanent residence, and may not be considered to be a noise sensitive land use.¹³ If Receiver Site 19 is not a noise sensitive land use or a residential use, the project-related noise impacts will not be significant, and would not require any noise attenuation measures.

Mitigation Measure 1A: No Mining Activities, Aggregate Plant Use, or Recycling Plant Use between 10 p.m. and 7 a.m.

As described in Table XII, the dominant noise sources affecting most of the affected receivers are expected to be the drill rigs, power shovel and bulldozers associated with mining. If mining activities were halted from 10 p.m. until 7 a.m. during the life of the project, the dominant noise sources at all receivers would be the asphalt plant, the aggregate plant, the recycle plant and the concrete batch plant. This measure would also eliminate nighttime use of the aggregate plant and the recycle plant, providing a significant reduction in overall noise levels. The remaining dominant noise sources would be the asphalt plant and the concrete batch plant.

Mitigation Measure 1B: Additional shielding of Concrete Batch Plant Truck Fill Area

As described in Table XII, the project-related noise sources for Receiver Site 19 change through the Phases, although they largely consist of processing activities. Restrictions on mining activities in Phases 1 and 2 have little effect on Receiver Site 19. When nighttime mining and operation of the recycling and aggregate plants are eliminated, the dominant remaining noise source is the filling of concrete haul trucks (ready-mix). The noise associated with this operation originates from the truck engine, which is run at a steady elevated speed to spin the concrete drum on the truck during loading.

The predictions of noise due to the concrete truck filling operations have assumed that the trucks will be partially shielded from view by the concrete batch plant structure. If the trucks were to be placed in a tunnel-like structure so that the sides of the truck and its engine were shielded by the walls of the tunnel, the noise level could be reduced by an additional 5 dB.

Mitigation Measure 1C: Between 10 p.m. and 7 a.m., Limit Processing Plant Use to Either the Asphalt Plant or the Concrete Batch Plant

¹³ This parcel is currently undeveloped, though a travel trailer is present, and the site is reportedly used occasionally by the property owner as a personal retreat. No water or power is supplied to the trailer, so it is not considered a permanent dwelling unit. As such, the site should not be classified as a noise sensitive land use under Riverside County General Plan Policy N 1.3 (see above).

To further reduce the total noise exposure during nighttime hours, the project would limit use of the asphalt plant and the concrete plant so that only one of those sources would be operating at any given time between 10 p.m. and 7 a.m. This would eliminate the noise contribution of one of the dominant noise sources remaining after exclusion of nighttime mining, the recycle plant, and the aggregate plant operation. Table XX lists the total nighttime noise levels that would be experienced in the worst-case condition where the asphalt plant is operating, and the concrete plant is not operating.

Significance after Mitigation: Significant with Respect to the Change in Ambient Nighttime Noise Levels in Phases 1 and 2.

Impact 2: Project-Related Noise Would Exceed L_{eq} Noise Standards at Receiver Site 36

As shown in Table XIX, project-related noise levels at Receiver Site 36 would exceed the nighttime L_{eq} standard during Phase 1.

Mitigation Measure 2A: Establish a Setback of 400 feet along the Northern Project Boundary

The project has been designed so that a buffer of about 400 feet is provided between the boundary with SMER and the pit excavations. As a result, the buffer strip and its topography serve as a barrier, especially for sources below the elevation of the property line. The insertion loss (noise reduction) provided by the buffer varies depending upon the source location. The ENM was used to predict the average noise levels that would be experienced at Site 36 if the 400-foot buffer was provided, and assuming that the native ground surface was maintained at its present elevations. The noise level reduction provided by the setback has been included in the predicted L_{eq} values shown by Table XIX.

Mitigation Measure 2B: No Mining Activities, Aggregate Plant Use, or Recycling Plant Use between 10 p.m. and 7 a.m.

This measure is the same as Measure 1A.

Mitigation Measure 2C: Additional shielding of Concrete Batch Plant Truck Fill Area

This measure is the same as Measure 1B.

Mitigation Measure 2D: Between 10 p.m. and 7 a.m., Limit Processing Plant Use to Either the Asphalt Plant or the Concrete Batch Plant

This measure is the same as Measure 1C.

Significance after Mitigation: Less than significant.

Impact 3: Project-Related Noise Would Exceed L_{eq} Noise Standards at Receiver Site 37.

As shown in Table XIX, project-related noise levels at Receiver Site 37 would exceed the nighttime L_{eq} standard during all project Phases.

Mitigation Measure 3A: No Mining Activities, Aggregate Plant Use, or Recycling Plant Use between 10 p.m. and 7 a.m.

This measure is the same as Measure 1A.

Mitigation Measure 3B: Additional shielding of Concrete Batch Plant Truck Fill Area

This measure is the same as Measure 1B.

Mitigation Measure 3C: Between 10 p.m. and 7 a.m., Limit Processing Plant Use to Either the Asphalt Plant or the Concrete Batch Plant

This measure is the same as Measure 1C.

Significance after Mitigation: Less than significant.

Appendices H1 through H4 show the predicted 45 dB and 65 dB L_{eq} contours for mitigated nighttime operations.

RIVERSIDE COUNTY NOISE ORDINANCE (L_{max}) STANDARDS

The Riverside County Noise Ordinance is not intended to be used as standards of significance for CEQA determinations. (Riverside County Ord. No. 847, Section 1.) Nevertheless, the project must comply with the Noise Ordinance requirement, or else seek an exception.

Noise Ordinance Standards

The applicable noise standards are as follows:

Section 4 General Sound Level Standards.

“No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in [Table XXII on the next page].”

(Riverside County Noise Ordinance, Section 4, codified at Riverside County Code, Section 0.52.040.)

As shown on Table XXI, the applicable Riverside County Noise Ordinance standard for property zoned Rural Residential (which includes the project site and surrounding areas) is 45 dB L_{max} during both daytime and nighttime hours. Some other residential zoning designations are subject to noise standards of up to 55 dB L_{max} during daytime hours, but all residential zoning designations are limited to 45 dB L_{max} during nighttime hours. These zoning designations generally apply to all Riverside County Receptor Locations, except for those located in SMER.

All “Open Space” general plan zoning designations, except for Mineral Resources zones, are subject to the 45 dB L_{max} standard during both daytime and nighttime hours. These zoning designations generally apply to all SMER Receptor Locations.

A portion of the project site is proposed to be re-zoned “Mineral Resources.” This zoning designation is subject to a 75 dB L_{max} daytime standard, and 45 dB L_{max} nighttime. This zoning designation only applies to a portion of the project site.

**TABLE XXI
RIVERSIDE COUNTY NOISE ORDINANCE SOUND LEVEL STANDARDS
SOUND LEVEL STANDARDS (dB L_{max})**

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	GENERAL PLAN LAND USE DESIGNATION NAME	DENSITY	MAXIMUM DECIBEL LEVEL		
				7am-10pm	10pm-7am	
Community Development	EDR	Estate Density Residential	2 ac	55	45	
	VLDR	Very Low density Residential	1 ac	55	45	
	LDR	Low Density Residential	½ ac	55	45	
	MDR	Medium Density Residential	2-5	55	45	
	MHDR	Medium High Density Residential	5-8	55	45	
	HDR	High Density Residential	8-14	55	45	
	VHDR	Very High Density Residential	14-20	55	45	
	H'TDR	Highest Density Residential	20+	55	45	
	CR	Retail Commercial		65	55	
	CO	Office Commercial		65	55	
	CT	Tourist Commercial		65	55	
	CC	Community Center		65	55	
	LI	Light Industrial		75	55	
	HI	Heavy Industrial		75	75	
	BP	Business Park		65	45	
	PF	Public Facility		65	45	
	SP		Specific Plan-Residential		55	45
			Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55	
		Specific Plan-Heavy Industrial		75	75	
Rural Community	EDR	Estate Density Residential	2 ac	55	45	
	VLDR	Very Low Density Residential	1 ac	55	45	
	LDR	Low Density Residential	½ ac	55	45	
Rural	RR	Rural Residential	5 ac	45	45	
	RM	Rural Mountainous	10 ac	45	45	
	RD	Rural Desert	10 ac	45	45	
Agriculture	AG	Agriculture	10 ac	45	45	
Open Space	C	Conservation		45	45	
	CH	Conservation Habitat		45	45	
	REC	Recreation		45	45	
	RUR	Rural	20 ac	45	45	
	W	Watershed		45	45	
	MR	Mineral Resources		75	45	

Exception Standard

The noise ordinance allows for exemptions to these noise standards for continuous noise sources. The requirements for an exception are as follows:

The [County] shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the [County] shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

(Riverside County Noise Ordinance, Section 7, codified at Riverside County Code, Section 9.52.070.B.)

Ambient Maximum Noise Levels Exceed Riverside County Noise Ordinance Standards

Table XXII lists the hourly measured maximum noise level values for each hour in daytime and nighttime periods. As shown on the table, ambient maximum noise levels at all of the Ambient Measurement Sites in the region exceed the Riverside County Noise Ordinance standards applicable to residential and open space uses. As described above, the ambient noise levels in the region are dominated largely by traffic-related noise from Interstate 15. From this, it can reasonably be assumed that the ambient maximum noise levels exceed the applicable Noise Ordinance standards at all of the Riverside County Receptor Locations.

Because the ambient maximum noise levels exceed the Noise Ordinance sound level standards, it would be impossible for the project to meet the requirement set forth in Section 4 of the Noise Ordinance (“No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards.”).

TABLE XXII			
COMPARISON OF MEASURED AMBIENT NOISE LEVELS TO RIVERSIDE COUNTY NOISE ORDINANCE STANDARDS			
<i>SHADED CELLS INDICATE THAT THE MEASURED LEVEL EXCEEDED THE APPLICABLE NOISE STANDARD</i>			
Ambient Measurement Site [Receptor Number]	Location	Sound Level, dBA	
		Maximum Hourly Noise Level (Lmax)	
		Daytime	Nighttime
M1 [14] ¹	SMER 1	61	54
M2 [15] ¹	SMER 2	61	55
M3 [10] ¹	Cell Tower ³	63	59
M4 [17] ¹	47725 Rainbow Valley Road	75	73
M5 [18] ¹	2658 Huffstatler ²	70	65
M6 [19] ¹	Kirkpatrick Property	60	53
M7 [20]	31320 Via Eduardo ³	63	52
M8 [21]	Rainbow Valley Rd. Temecula ³	69	67
M9 [35]	28816 Pujol ³	68	61
<i>Riverside County Noise Ordinance Standard – Rural Residential</i>		45	45
¹ - Values for these sites were averaged over a 7-day measurement period. ² - Located in San Diego County (included for comparison purposes). ³ - Located in the City of Temecula (included for comparison purposes).			

Maximum Project-Generated Noise Levels

As described above, there are two main categories of project-related noise generators, onsite activities and offsite vehicle traffic.

Onsite Activities

As described above, for the fixed project equipment, such as the asphalt plant, crushers, and screens, the maximum noise levels produced during equipment operation will be essentially the same as the average noise levels. Similarly, bulldozers, loaders, power shovels, and drill rigs will run continuously, so the average and maximum noise levels from those sources are the same. Exceptions will occur at a crusher or gyratory, for example, when large rocks cause impact sounds inside the crusher, but the sampling methods used to derive the noise modeling assumptions described above included those variations in the measured energy-average noise level.

Therefore, the project's average noise levels (L_{eq}) are assumed to be the same as the maximum noise levels (L_{max}). The predicted average noise levels for the various Phases are shown in

Tables VIII through XI above. As shown in those Tables, the project will not cause maximum noise levels in excess of 45 dB at any Riverside County Receiver Locations except for Sites 19, 36, and 37.

As described above, periodic blasting activities (1-2 times per day) will result in peak A-weighted sound pressure levels of up to 64 dB. In practice, the maximum noise levels will likely be lower given that most of the sound energy resulting from blasting activities is concentrated below the threshold of human hearing. Thus, the resulting maximum noise levels can be expected to be similar to the shutting of a car trunk.

Therefore, with the Mitigation Measures, project-related noise generated by onsite activities can be maintained at or near the Noise Ordinance nighttime standards, although the project will likely exceed the daytime maximum noise standards.

Vehicle Noise Levels

Maximum noise levels experienced during events such as dumping or loading cycles, or truck passages, will be higher than the average hourly noise level for a set of such events. For nearly all of the sources in question, the noise sources are diesel engines. It has been customary to assume that diesel-powered trucks, loaders, bulldozers, etc. produce a maximum noise level of about 86 dB when passing by at a distance of 50 feet. This is a worst-case estimate, as modern diesel-powered equipment produces lower noise levels, in the range of 78 to 80 dB at 50 feet.

Making the worst-case assumption that a diesel-powered vehicle will produce 86 dB at 50 feet means that such vehicles will produce 75 dB at a distance of about 180 feet, and 45 dB at a distance of about 5,600 feet. These predictions account only for spherical spreading of the sound energy, and do not include the effects of ground and air absorption of sound, nor of shielding provided by topography.

This means that trucks or similar vehicles passing within about 180 feet of a property line would likely exceed a daytime maximum noise level standard of 75 dB at that property line. To achieve a maximum nighttime noise level standard of 45 dB at a property line, such vehicles would have to pass more than one mile from the property line.

Trucks going to and coming from the quarry on the proposed access road have the potential to produce maximum noise levels exceeding the 45 dB standard at the residences east of the project site, where it will be possible to have a clear line of sight to the access road. The maximum noise levels for trucks on the access road will typically be about 5 dB higher than the predicted average noise level (L_{eq}).

Referring to Tables VIII through XI, it may be concluded that the predicted maximum noise levels due to trucks on the access road would be in the range of 49 to 50 dB at receiver Sites 17 and 18. As a result, the 45 dB maximum nighttime noise level standard would be exceeded at those locations, which are typical of sensitive receiver locations east of the project in the Rainbow Valley area and nearby portions of Riverside County.

The ambient noise level measurement data at Sites 17 and 18 reveal that the maximum noise levels currently experienced at those sites exceed the Riverside County noise standard. In fact, the measured median noise levels (the level exceeded 50% of the time) during the quietest periods of the 24-hour day ranged from 54 to 63 dB, which means that the 45 dB standard was exceeded more than 50% of the time. The maximum noise levels produced by trucks on the access road were also exceeded by ambient noise sources (primarily freeway traffic) more than 50% of the time.

At Site 17, the maximum noise levels produced by trucks on the access road would be partly masked by ambient traffic noise. Maximum truck noise level events would likely be perceptible at this site during the quietest periods of the day or night, but would probably be indistinguishable from the noise produced by trucks on I-15.

At Site 18, the maximum noise levels produced by trucks on the access road would typically be masked by ambient traffic noise, and would likely be imperceptible.

Therefore, even with the Mitigation Measures described above, the maximum noise levels caused by project-related traffic will exceed the applicable Riverside County Noise Ordinance standards. However, due to the high ambient maximum noise levels caused by traffic on I-15, the maximum noise levels caused by project-related traffic will be essentially indistinguishable from the ambient maximum conditions.

Conclusion

The ambient maximum noise levels in the project vicinity already exceed the Noise Ordinance standards. As mitigated, the project will not cause significant permanent or temporary increases in ambient noise levels. Finally, to the extent that project-related noise sources may exceed the Noise Ordinance standards, those sources are located such that they will be essentially indistinguishable from the ambient noise from Interstate 15. Therefore, the project will not be detrimental to the health, safety or general welfare of the community.